

# Retrofit Kit User's Manual

Strand Lighting

Document Part #:	2-450152-010
Revision Level:	1r2
Revision Date:	1997-09-22

## Offices And Service Centers

Phone numbers do not include country code or other international access data.

World Wide Web: <http://www.strandlight.com>

Asia: 7th Floor, Corporation Sq, 8 Lam Lok St, Kowloon Bay, Kowloon, Hong Kon

Tel: 757-3033 Fax: 757-1767

Canada: 2430 Lucknow Dr., Unit 15, Mississauga, ontario L5S 1V3 Canada

Tel: (905) 677-7130 Fax: (905) 677-6859

Italy: Via delle Gardenie 33 (Pontia Vecchia KM 33,400), 00040 Pomezia-Roma, Italy

Tel: 6914-7123 Fax: 6914-7136

U.K.: North Hyde House, North Hyde Wharf, Heston, Middlessex, UB2 5NL, United Kingdom

Tel: 0181-560-3171 Fax: 0181-568-2103

US Service & Support (800) 4 STRAND ((800) 478-7263)

U.S.A.: 18111 South Santa Fe Ave., Rancho Dominguez, CA 90221 USA

Tel: (310) 637-7500 Fax: (310) 632-5519

The material in this manual is for information purposes only and is subject to change without notice. Strand Lighting assumes no responsibility for any errors or omissions which may appear in this manual. For comments and suggestions regarding corrections and/or updates to this manual, please contact your nearest Strand Lighting office.

El contenido de este manual es solamente para información y está sujeto a cambios sin previo aviso. Strand Lighting no asume responsabilidad por errores o omisiones que puedan aparecer. Cualquier comentario, sugerencia o corrección con respecto a este manual, favor de dirigirlo a la oficina de Strand Lighting más cercana.

Der Inhalt dieses Handbuchs ist nur für Informationszwecke gedacht, Änderungen sind vorbehalten. Strand Lighting uebernimmt keine Verantwortung für Fehler oder Irrtümer, die in diesem Handbuch auftreten. Für Bemerkungen und Verbesserungsvorschläge oder Vorschläge in Bezug auf Korrekturen und/oder Aktualisierungen in diesem Handbuch, moechten wir Sie bitten, Kontakt mit der naechsten Strand Lighting-Niederlassung aufzunehmen.

Le matériel décrit dans ce manuel est pour information seulement et est sujet à changements sans préavis. La compagnie Strand Lighting n'assume aucune responsabilité sur toute erreur ou omission inscrite dans ce manuel. Pour tous commentaires ou suggestions concernant des corrections et/ou les mises à jour de ce manuel, veuillez s'il vous plait contacter le bureau de Strand Lighting le plus proche.

Copyright 1997, Strand Lighting Limited. All rights reserved.

Information contained in this document may not be duplicated in full or in part by any person without prior written approval of Strand Lighting. Its sole purpose is to provide the user with detailed operational information for the equipment supplied. The use of this document for all other purposes is specifically prohibited. Certain features of the equipment described in this document may form the subject of patents or patent applications.



**Danger**

**This equipment is designed to operate from the mains electricity supply and contains voltages which, if touched, may cause death or injury. It should only be operated in accordance with these instructions and for the purpose of a lighting control system.**

# Table of Contents

---

<b>Introduction and Assistance .....</b>	<b>1</b>
Manual Organization .....	1
Definitions .....	2
Conventions .....	4
Technical Assistance .....	4
Problems .....	4
Questions .....	4
Spare Parts .....	4
Comments and Suggestions .....	4
World Wide Web .....	5
<b>Operational Features .....</b>	<b>6</b>
Configuration .....	6
Programming Rack Functions .....	7
Setting Dimmer Characteristics .....	7
Inputs .....	8
Outputs .....	8
Security Features .....	9
SWC™ (System Wide Control) .....	9
Outlook™ .....	10
Servicing .....	10
<b>Hardware Description.....</b>	<b>12</b>
Fan Module .....	12
Electronics Chassis .....	12
Processor Module .....	13
Power Supplies .....	13
Retrofit Interface PCB .....	13
Central Interconnection Card (CIC) .....	13
<b>Installation.....</b>	<b>14</b>
What You Need .....	14
Parts Supplied with Kit .....	14
Environmental Considerations .....	14
Power Requirements .....	15
Removing the Old Electronics .....	15
Installing the Retrofit Kit .....	17
Install the Air Baffles .....	17
Hook Up the New Electronics Chassis .....	18
Rack Type .....	20
Rack Configuration .....	21
Auxiliary Wiring .....	22
Connections Between Racks.....	22

Primary Dimmer Control Wiring .....	22
Dimmer Control Wiring Termination .....	22
SWC and Digital Network Control Wiring .....	27
Panic Control Wiring .....	28
Automatic PANIC Setting .....	29
Other Contact Connections .....	29
Overtemperature Warning LED Wiring .....	30
Analog Control .....	30
Analog Output .....	32
Selecting Dimmers for Panic Operation .....	33
Closing the Rack .....	34
Check All Wiring .....	34
Close the Rack .....	34
Apply System Power .....	35
Setting Up the Processor .....	36
Startup .....	36
After Startup .....	36

## **Front Panel Programming..... 39**

Navigating the System .....	40
Keypad Lock.....	40
The Keypad.....	41
Fields.....	43
Default Display .....	45
Main Menu .....	46
Set Dimmer Levels .....	47
Outlook Presets Menu .....	49
Recording and Recalling Presets .....	50
Set Channel Levels .....	50
Set Fade Times .....	50
Set the Power Up Preset .....	52
SWC Preset Menu .....	52
Activate a Preset .....	53
Record a Preset .....	55
Set the NoMux Preset .....	56
Set Fade Time .....	57
Mux Inputs Menu .....	59
Patching Menu .....	63
Patch Dimmers to Rooms .....	64
Set the Starting Mux Address .....	65
Patch Dimmers to Mux Signals .....	66
Patch Analog Outputs .....	66
Patch Dimmers to Analog Inputs.....	67
Set the Starting Circuit Number .....	68
Set Individual Circuit IDs .....	69
Dimmer Curves Menu .....	70
Set Incandescent Dimmer Curves.....	71
Set Dimmers to Non-Dim .....	72

Dimmer Response Menu .....	73
Rack Config Menu .....	75
Set Language .....	76
Set Slot Type.....	77
Set Rack Number .....	78
Set Maximum Output Voltage .....	79
Set Minimum Dimmer Levels .....	79
Set Key Lock Status.....	79
Set Fan Speed Control .....	79
Edit User Curves .....	81
Set Time and Date .....	82
View Serial Number .....	83
View Panic Map .....	83
Return the Rack to Default Values .....	83
Clear Profile .....	84
Default SR Config .....	84
Calib Menu.....	85
Set LCD Display Contrast .....	86
Set Phase Voltage .....	87
Set Phase Filters .....	88
Set Analog Mux Input Scaling .....	88
Set Analog Input Scaling .....	90
Set Analog Output Scaling .....	91
Set Dimmer Phase .....	91
Check Memory Values .....	91
Change the Event Reporting Configuration .....	92
Error Log.....	92
<b>Basic Troubleshooting.....</b>	<b>93</b>
Understanding the Control Signal Path .....	94
Failure & Status LEDs .....	95
Error Log.....	96
Startup Errors .....	97
Loading New Software .....	98
Replacing Major Parts .....	100
Replacing a Processor Module .....	100
Reconfiguring a Processor Module .....	101
Isolating Parts .....	102
System Problems .....	102
Individual Dimmer Problems .....	106
Parts Drawings .....	107
<b>Periodic Maintenance.....</b>	<b>109</b>
<b>Index .....</b>	<b>111</b>

## Table of Figures

Figure 1. Hook up New Electronics Chassis .....	18
Figure 2. Central Interconnection Card .....	19
Figure 3. Rack Type .....	20
Figure 4. Rack Configuration .....	21
Figure 5. DMX512 Termination .....	22
Figure 6. DMX512 Wiring .....	23
Figure 7. DMX512 Dimmer Control Extension Cable .....	24
Figure 8. AMX192 Wiring .....	24
Figure 9. AMX192 Extension Cable .....	25
Figure 10. XLR to TA4 Series Adapter .....	25
Figure 11. D54 Wiring .....	26
Figure 12. D54 Termination .....	26
Figure 13. SWC/Outlook Wiring and Termination .....	28
Figure 14. PANIC Wiring .....	28
Figure 15. Automatic PANIC Setup .....	29
Figure 16. Other Contact Connections .....	30
Figure 17. Overtemperature Warning LED Connection .....	30
Figure 18. Typical CD80 Analog Control Hookup .....	31
Figure 19. Analog Output Drivers .....	32
Figure 20. Final Module Installation .....	34
Figure 21. Processor Module Front Panel .....	36
Figure 26. Keypad Layout.....	41
Figure 27. Incandescent Dimming Curves .....	71
Figure 28. Control Signal Path Diagram .....	94
Figure 29. Electronic Chassis Indicators .....	95
Figure 30. Processor Module Indicators .....	95
Figure 31. Software Reload Cable .....	99
Figure 32. Part numbers .....	107

## Table of Tables

Table 1. Factory Default Values for Dimmers .....	83
Table 2. Factory Default Values for Rack .....	84

# Introduction and Assistance

---

## Chapter 1

This manual provides information on the installation and operating procedures for CD80sv Electronics Retrofit Kit.

---

### Manual Organization

This manual contains the chapters shown below, plus an Index.

**Introduction and Assistance** (chapter 1) - tells you about the organization of this manual, plus definitions and conventions used. Also tells you how to get technical help if necessary.

**Operational Features** (chapter 2) - gives an overview of the operational and programmable features of the CD80sv Retrofit Kit.

**Hardware Description** (chapter 3) - gives an overview of the major hardware components in CD80 dimmer racks with the CD80sv Retrofit Kit.

**Installation** (chapter 4) - tells you about the installation requirements for the dimmer rack. This chapter shows pinouts for externally accessible connectors, cable types and lengths, and (where applicable) setup information.

**Front Panel Programming** (chapter 5) - tells you how to use the menus in the processor module to configure the system if necessary.

**Basic Troubleshooting** (chapter 7) - tells you how to begin troubleshooting if you have problems with dimmers or the rack.

**Periodic Maintenance** (chapter 8) - lists the steps which should be taken to keep the equipment running at its best.

---

## Definitions

This manual uses the following definitions throughout:

- channel** Device controlling a dimmer or group of dimmers. Historically, there is a physical controller (such as a slider) for each channel. On most current control systems, channels are numbers accessed by a numeric keypad. Each channel can control multiple dimmers.
- CIC** (central interconnection board) The printed circuit board on which all contractor control wiring connections are made. It is located on the top of the Electronics Chassis.
- circuit** Connection device and wiring for powering a lighting fixture from a dimmer.
- circuit ID** A unique 4 digit number which you can assign to each dimmer. The circuit ID may be the same as the dimmer number, or may be used to indicate circuit location, phase, channel number, etc. This feature is useful for system wide control and Reporter PC™ functions.
- crossfade** A fade which contains both an up-fade and a down-fade. Also may refer to any fade where the levels of one cue are replaced by the levels of another cue.
- cue** The process of recalling a preset from its memory location and putting the result on stage.
- Preset, memory, and cue are often used interchangeably.*
- curve** The relationship between a control level and the actual dimmer output. Also known as “dimmer law.”
- dimmer law** See “curve.”
- dimmer** Device controlling power to a lighting fixture. Two lights on the same dimmer cannot be separately controlled.
- default** The original factory settings.
- fade** A gradual change in stage levels from one set of intensities (“look”) to another.
- fade time** The time it takes for dimmer levels to go from their current levels to the levels in the selected preset. Each preset has its own fade time.
- Level** A numerical value used to express the “brightness” of a dimmer. Usually shown as %.
- Mux** Abbreviation of the word “Multiplex.” Multiplex systems transmit data (usually dimmer information) from a lighting controller to a dimmer rack via a single cable rather than via a pair of wires for each dimmer.
- patch** Historically, the process of physically connecting circuits to dimmers. Now usually refers to electronic assignment of dimmers to channels.



<b>phase</b>	The three phases of the mains supply to which the dimmers are connected are identified as phase 1, phase 2, and phase 3 in Europe and phase A, Phase B, and Phase C in the US.
<b>power module</b>	A chassis containing one or two dimmers or contactors. This is sometimes referred to as a “dimmer.” However, each power module can have one or two dimmers or contactors in it, so this manual distinguishes between dimmers (individual power control circuits) and power modules (a collection of one or more power control circuits).
<b>preset</b>	A pre-defined setup of intensities for a set of channels, stored in memory for later replay. For Outlook applications, the processor module stores 8 programmable presets per room for up to 16 rooms. For SWC applications, the processor module stores 99 programmable presets. Preset 0 (ZERO) is always a blackout.
<b>preset fade time</b>	See “Fade Time.”
<b>rack number</b>	A number used to uniquely identify each dimmer rack in a multiple rack system. Rack numbers are set from the front panel of the processor module, and are usually set by the installation engineer.
<b>room</b>	An area separately defined for purposes of architectural lighting control (e.g., Outlook control stations). This is usually either a room in the traditional sense (an indoor enclosed area) or a portion of a room which can be partitioned off. Each room may be separately and simultaneously controlled by the system.
<b>SSR</b>	(solid state relay) A power control device used in Strand dimmers that contains two silicon control rectifiers (SCRs), control circuitry, and optical isolation circuitry.
<b>SWC</b>	(system wide control) A method of programming and controlling more than one dimmer rack simultaneously. A hand held controller lets you program and recall all 99 presets, and control individual dimmers. 8 and 16 channel pushbutton stations, and an A/V interface, let you recall any 8 or 16 of the 99 presets at each station. Please contact Strand Lighting or see the <i>System Wide Control Data Sheet</i> or <i>System Wide Control User's Manual</i> for details on how SWC works.

---

## Conventions

The following additional conventions are used in this manual.

**\$** Shows the actual push-button labeled "ESC."

**ON** (all capital text) shows the status of a function or switch, as in "Turn the switch ON."

**Input** (text with first letter capitalized) shows the actual menu selection for menu displays with text selections (e.g., Fan speed can be set to Fixed or Variable).

**Patch** (bold text with first letter capitalized) shows a menu name (e.g., Patch menu).

*Operational Features* (italic text) refers to a specific chapter or section name, and to specific menu items. Also used for emphasis in notes.

---

## Technical Assistance

CD80sv Retrofit Kit electronics require a minimum of maintenance and servicing. See chapter 7 for basic troubleshooting procedures, and chapter 8 for periodic maintenance procedures.

**Problems** If equipment fails to operate properly upon installation, or under normal load and temperature conditions, and basic troubleshooting procedures are not effective, please contact your nearest Strand Authorized Service Center or Strand Lighting Field Service at the office serving your area.

**Questions** For technical questions regarding setup, operation, or maintenance of this equipment, please contact your nearest Strand Authorized Service Center or the Strand Lighting Field Service office serving your area.

**Spare Parts** For purchase of upgrades, accessories, peripherals or documentation, please contact your nearest Strand Authorized Service Center or the Strand Lighting office serving your area.

**Comments and Suggestions** For comments regarding equipment functions and possible improvements, or for comments on this manual, please write to the Strand Lighting office serving your area.

**World Wide Web** You can access the Strand Lighting World Wide Web site at <http://www.strandlight.com>.



# Operational Features

---

## Chapter 2

This chapter presents the basic operational features of the CD80sv Retrofit Kit.

---

### Configuration

Processor modules have 96 dimmer control outputs to drive CD80 or CD80 Advanced Electronics dimmers, and 12 analog outputs (0 to +10 volts at 1mA maximum) for auxiliary control.

The following configuration items are usually programmed in the factory or during commissioning, but can also be reprogrammed by the user.

- Processor module display is in English.
- Arrangement of dimmer module types for each module position is programmed. From this information, dimmers and analog outputs are given sequential dimmer numbers to simplify programming.

---

## Programming Rack Functions

Several additional functions are generally accessed or programmed in the field by the user as required:

- Rack number (1-99) is set.
- Panic selection and configuration
- Maximum output voltage (per dimmer): 50-250 volts (e.g. set to 105V for extended lamp life).
- Minimum level (per dimmer): 0% - 100% (e.g. set to 10% for aisle lights or large lamp preheat).
- Room and channel Patching (for applications using Outlook and other Digital Network Control compatible stations).
- Each dimmer and analog output can be patched to any valid DMX512, AMX192, or D54 address number for the standard multiplex input A (Mux A). Dimmers can only be patched to valid DMX512 address numbers for multiplex input B (Mux B).
- Circuit ID--used by SWC.
- Response curve assignment (per dimmer): Linear, Square, S-Curve, and Non-Dim. The Non-Dim curve lets you set the turn-on threshold for the non-dim. An additional 5 user defined curves can be defined using the Rack Config menu, or downloaded from the Reporter PC software.
- Record and recall presets (1-8, ON and OFF per room for Outlook control, and 0-99 per rack for System Wide Control).
- Define Preset Number or "Hold" condition on Mux failure.
- Define power-up preset per rack for architectural presets.
- Calibrate top set between 7 and 13 volts for analog inputs.
- Calibrate top set between 0 and 10 volts for analog outputs.
- Set LCD contrast.
- Error log accessible from the processor module.

---

## Setting Dimmer Characteristics

Since the control electronics for all dimmers is in the processor module, several characteristics traditionally associated with the dimmer module can be set in the processor module.

- The output response curve can be set to Linear Power, Square, S-Curve, and Non-Dim. The Non-Dim setting lets you set the turn-on threshold for the non-dim. 5 additional user programmable curves are available through the Rack Config menu or from the optional reporter software.
- Dimmer response (per dimmer): fast (30ms), normal (100ms) or slow (300ms). This determines a dimmer's rate of response to a change in control level. Slow is usually set for large tungsten loads to reduce filament inrush, medium or fast for small loads.

- Dimmer control assignment (per dimmer) to the "combined" levels of Outlook preset, SWC preset, Mux A, Mux B, and analog ("Input") or to a fixed level (0% - 99% or "Full"). The way in which the various input levels combine is also determined on a per dimmer basis by setting the dimmer Mux mode.
- A special smoothing algorithm is applied to small level changes to maintain smooth fades with long fade times.
- 5 user laws are set to 1:1 by default, and can be programmed from the Rack Config menu or from the Reporter PC.

---

## Inputs

The following control inputs are available on the CD80sv Retrofit Kit.

- Multiplex A input, selectable for DMX512, AMX192, or D54 inputs.
- Multiplex B input for DMX512 only.
- 32 analog inputs patchable to any dimmer.
- Digital Network Control for Outlook™ and compatible architectural control stations.
- SWC™ (system wide control) for remote preset panels, A/V interface, and hand held programmer.
- Rack keypad and LCD display to program all functions.
- RS232 port for enabling setup, playback, show memory storage, and operating software upgrades.
- External switch contacts for main/backup processor selection, MuxA/MuxB selection, PANIC enable/disable, "Go to Preset 1," and "Go to Next Preset."

All control connections are in a single location for easy access, and are via 2-part plug-in screw terminal connectors for easy removal of the Electronics Chassis.

---

## Outputs

The following outputs are available from the processor module.

- 96 dimmer control signals.
- 12 Analog outputs (96 channel processor only) for external equipment.

---

## Security Features

In order to minimize the impact of failures to any part of the dimmer racks, a number of security features are provided with the CD80sv Retrofit Kit.

- Convection cooling of all components with fan assist.
- 3 fans.
- Rack overtemperature warning.
- Rack shutdown at 5° C above warning level.
- The processor module can be set to hold the last dimmer levels forever, or to fade to a specified SWC preset after a preset interval in cases of multiplex signal failure.
- Setup data is stored in non-volatile memory.
- Memory card can be easily moved on exchange of processors.
- 2500V opto-isolation of Mux A and Mux B DMX512 inputs, SWC input, Outlook input, Reporter input, and external switch contact inputs.
- Any of 96 dimmers and 12 analog outputs (96 channel processor only) can be assigned to PANIC with a mechanical switch. PANIC can be activated (full ON) from the dimmer rack front panel or from a remote momentary contact switch. This activation does not require processor intervention. It is strictly hardware activated.
- Automatic PANIC on removal or failure of processor module. In racks with two processor modules, both modules must be removed to activate PANIC.
- Keypad lock.

---

## SWC™ (System Wide Control)

SWC lets you control multiple racks from a single location. A hand held controller lets you program and recall all 99 presets, and control individual dimmers. 8 and 16 channel pushbutton stations let you record or recall any 8 or 16 of the 99 presets at each station. An audio visual interface is also available to activate presets from external contacts. Contact Strand Lighting or see the *System Wide Control User's Manual* for details on how SWC works.

---

## Outlook™

Outlook is a comprehensive family of control stations designed for architectural applications needing a simple, flexible control solution with minimal installation and cabling costs. These control stations can access, modify, and recall lighting levels stored in the processor module. Outlook control station features and options include:

- Control up to 16 separate rooms, with up to 12 channels per room
- 8 preset scenes plus ON and OFF for each room
- Manual sliders (3, 6, 9, or 12 sliders per station) for direct control of individual circuits
- Record facility for saving slider levels for future pushbutton recall
- Programmable fade times between 0 and 4 minutes from Outlook control stations or 0 to 10 minutes from the processor module or Reporter software
- Record lockout facility for playback-only operation
- 1, 4, and 8 preset pushbutton stations
- Audio-visual interface
- Room combine stations for room partitioning

---

## Servicing

CD80sv Retrofit Kit electronics are designed to be easily serviced in the field. They incorporate:

- A single connector card for contractor control connections for easy installation and maintenance
- Retrofit Interface PCB easy connection of the Retrofit Kit to the dimmer rack
- Replaceable processor module





## Chapter 3

The CD80sv Retrofit Kit is an Electronics Chassis designed to fit in classic CD80 and CD80 Advanced Electronics dimmer racks and update the electronics to current standards.

---

### Fan Module

The dimmer racks are cooled by a set of three low noise fans in a fan module at the bottom of the rack. Cooling air is pushed up through the dimmer stack and exhausted through venting at the top of the rack. These fans are for dimmer cooling only, and are ON when any single dimmer is set to a level greater than zero.

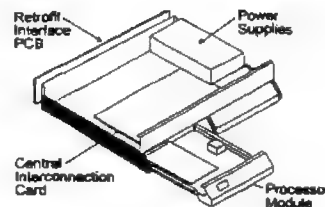


Air baffles provided with the Retrofit Kit ensure that the air is forced through the dimmers and not directly up the sides of the rack.

---

### Electronics Chassis

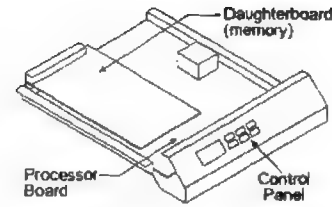
Each CD80sv Retrofit Kit contains an Electronics Chassis with all of the control electronics for the rack. This chassis contains the processor module, control station power supplies, central interconnection card (CIC), and Retrofit Interface PCB for the rack.



## Processor Module

Each CD80sv Retrofit Kit contains one processor module. The processor module has an 8 character by 2 line backlit LCD display, a 6 key keypad, and 6 LEDs to report processor module and dimmer status and allow simple setup and control at the rack.

This display normally shows the rack number and the OK message. If there are any rack or dimmer events reported, the display will show error messages.



Pressing the > key takes you into a series of setup menus to view and set up the more frequently used CD80 processor features. See chapter 5, *Processor Module Programming* for details on accessing these functions.

All programmed data is held in battery maintained RAM on the processor module daughter board for up to 6 months without power to the rack.

## Power Supplies

Each CD80sv Retrofit Kit has three power supplies, which are mounted on the Electronics Chassis.

## Retrofit Interface PCB

The Retrofit Interface PCB is mounted on the rear of the Electronics Chassis, and provides connections for the control wiring that is already present in the CD80 or CD80 Advanced Electronics dimmer rack. Connections for additional functionality are available on the Central Interconnection Card (CIC). All connections are plug-in to allow easy removal of the Electronics Chassis from the rack if necessary.

## Central Interconnection Card (CIC)

The Central Interconnection Card (CIC) is mounted face up on the top of the Electronics Chassis, and provides termination for functionality beyond the original wiring in the CD80 or CD80 Advanced Electronics dimmer rack. Control terminal strips are 2-part plug-in strips to allow easy removal of the Electronics Chassis from the rack if necessary.

---

### What You Need

Before installing your CD80sv Retrofit Kit, you should carefully consider the environment in which the equipment is to be installed, the power feeding the equipment, and the required conduit and/or cable runs.

**Parts Supplied with Kit** You should receive the following parts with the CD80SV Retrofit Kit:

- Electronics Chassis
- Fan Module
- Left Air Baffle
- Right Air Baffle
- Spares and screws

If you have not received all of these items, please contact Strand Lighting before proceeding.

**Environmental Considerations** To maximize equipment life, and minimize the chance of failures, the following environmental requirements should be met:

- Operating temperature: 0 to 40°C ambient
- Humidity: 5%-95% non-condensing
- Storage temperature: -40°C to 70°C
- Shock resistance in transit without damage: 40G 10mS in any of the X,Y,Z planes



**Warning**

***This Equipment Is For Indoor Use Only!***

***Utilizer Dans Un Endroit A L'Abri!***

## Power Requirements

The CD80sv Retrofit Kit is available in a 90-145VAC, 50/60Hz version (part #76463) and in a 200-265VAC, 50/60Hz version (part #76464). The correct voltage power source must be provided for processor module. Processor modules can operate on any power source in the listed ranges.



**Do not install this equipment with power applied. Make sure that your incoming power is disconnected before proceeding.**

## Removing the Old Electronics

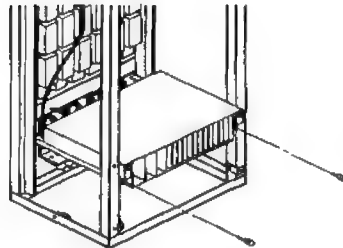
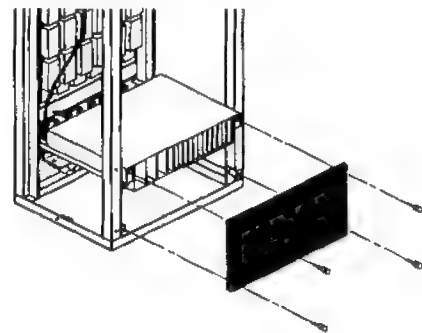
Warning

Before you install the CD80sv Retrofit Kit you must remove the old electronics and fans from the dimmer rack.

*If you have a CD80 Advanced Electronics system with A and B racks, you will need to do some additional wiring between the A and B racks before installing the CD80sv Retrofit Kit. Please consult Strand Lighting for what you need to do in this case.*

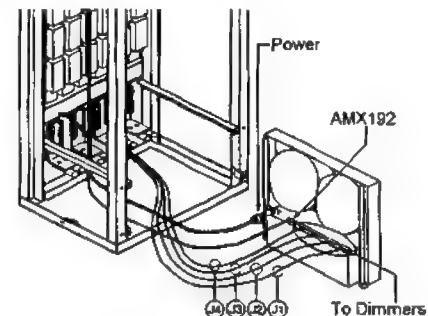
To remove a CD80 Fan Module from the dimmer rack:

1. Remove the dimmer rack door and the bottom 3-4 rows of dimmers and dimmer trays so that you have some room to work.
2. Remove four (4) thumb screws holding the bottom grill in place, and remove the bottom grill



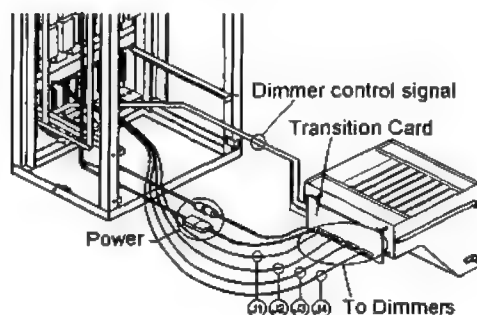
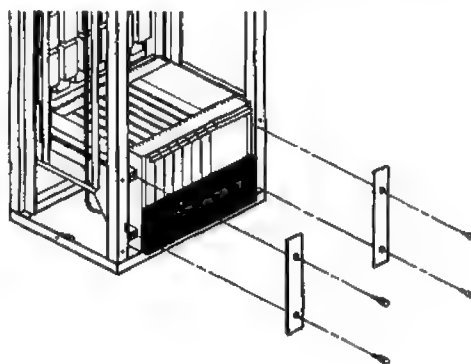
3. Remove two (2) thumb screws holding the Fan Module in place.
4. Slide the fan housing out of the rack and place it on the floor in front of the dimmer rack

5. Remove the power connector, the AMX192 connector, and the dimmer signal connectors (J1-J4) from the back of the Fan Housing.



To remove a CD80 Advanced Electronics chassis from the dimmer rack:

1. Remove the dimmer rack door and the bottom 3-4 rows of dimmers and dimmer trays so that you have some room to work.
2. Remove the four (4) finger bolts and that hold the Electronics Chassis and its two (2) trim plates.
3. Remove the two (2) trim plates and slide the Electronics Chassis out of the dimmer rack



4. Disconnect the power connectors, the control signal connectors (P21 and P22), and the dimmer signal connectors (J1-J4) from the back of the Electronics Chassis. Before disconnecting, make sure all cables are labeled.

*The connectors to P21 and P22 are connected behind the Transition Card mounted on the rear of the Electronics Chassis. You may need to remove the Transition Card to access the connectors.*

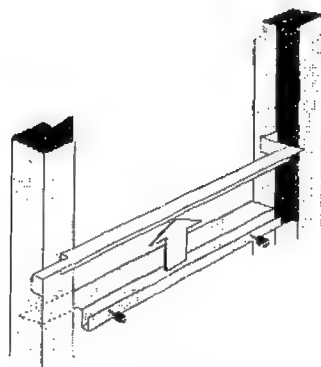
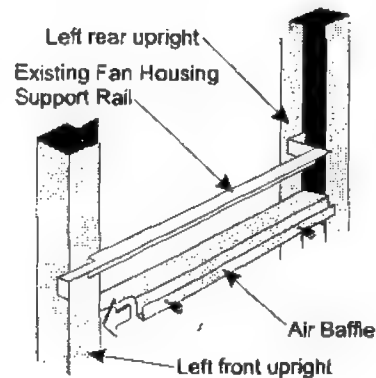
## Installing the

### Retrofit Kit

#### Install the Air Baffles

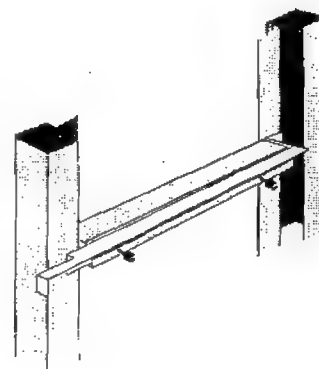
Install the new air baffles that came with the kit. There is a baffle for each side of the dimmer rack. The drawings below show installing the air baffle on the left side of the dimmer rack.

1. Remove the front screw on the air baffle.
2. Position the air baffle as shown so that you can slide the front tab of the air baffle into the hollow upright corner support.



3. Slide the air baffle as far forward as you can with the front tab inside the corner support.
4. Raise the baffle up so that the groove with screws encloses the bottom part of the Fan Housing Support.

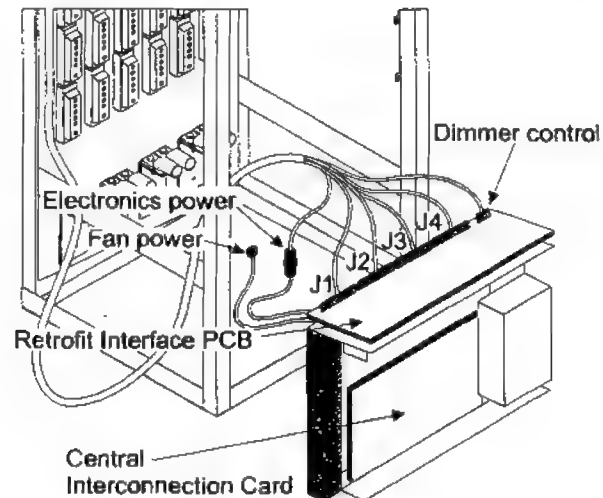
5. Mark the location of the front screw of the air baffle.
6. Remove the air baffle and drill a 1/4" hole through the support rail.
7. Replace the air baffle and tighten the screws.
8. Repeat for the right side air baffle.



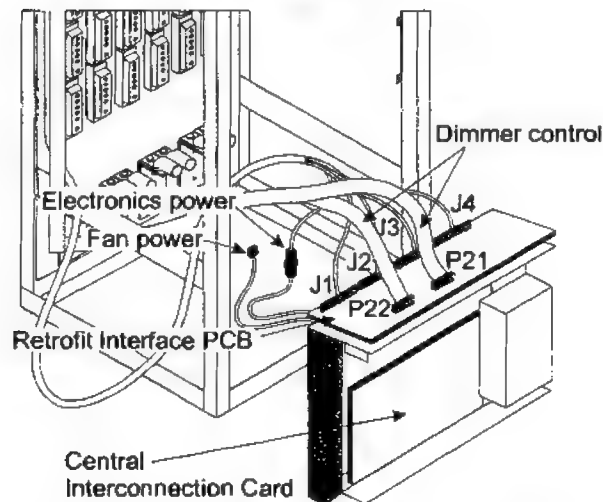
## Hook Up the New Electronics Chassis

To install the Electronics Chassis in the dimmer rack:

1. Set the Electronics Chassis on its end so you can get to the plugs on the Retrofit Interface PCB and the Central Interconnection Card are accessible.
2. Connect the dimmer control wires from the rack to J1-J4 on the Retrofit Interface PCB.
3. For CD80 Racks, connect the AMX connector (10-pin Molex) to J5.
4. For CD80 Advanced Electronics racks connect the ribbon cables to P21 and P22.
5. Connect the round power connector on a pigtail to the round power connector from the dimmer rack.



**For CD80 Racks**

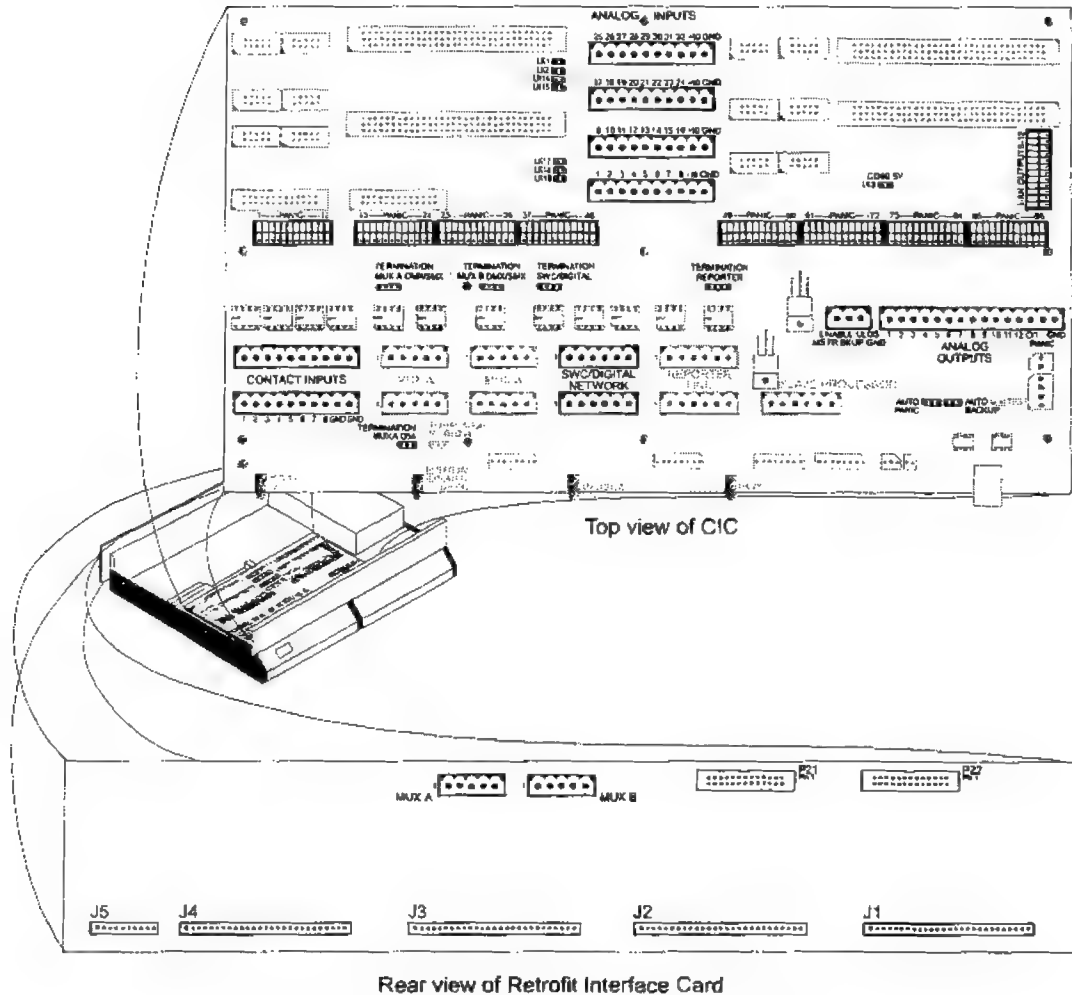


**For CD80 Advanced Electronics Racks**

**Figure 1. Hook up New Electronics Chassis**

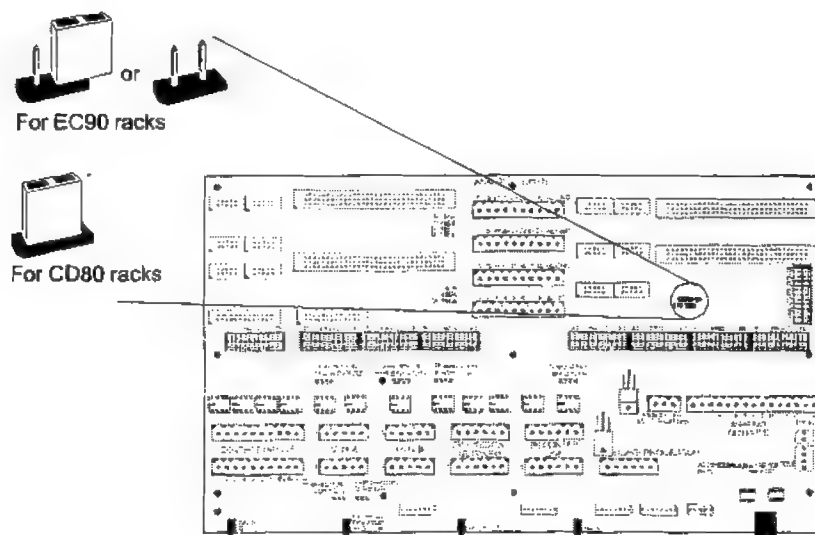


The CD80sv Retrofit Kit accepts a variety of control signals as inputs, and provide several types of output signals. Contractor control signal wiring goes to the CIC located on the top of the Electronics Chassis, or to the Retrofit Interface PCP located on the rear of the Electronics Chassis, and is made to 2-part plug-in terminal strips.



**Figure 2. Central Interconnection Card**

**Rack Type** Make sure that the rack type link (LK3) is installed. This link is installed for all CD80 and CD80sv racks. It is not used in the European versions (EC90) of these racks.



**Figure 3. Rack Type**

**Rack Configuration** Check the fan module to make sure that the fans are for the same voltage as the incoming mains power. The fan voltage rating is on the side of the fans. If the fans are not for the correct voltage, contact Strand Lighting for replacements.

#### Set Processor Defaults

If you have a 240VAC Retrofit Kit, make sure that LK1 is installed on the CIC. If you have a 120VAC operation, make sure that LK1 is not installed. This jumper tells the processor the operating voltage so it can display the correct default settings.

#### Set Phasing

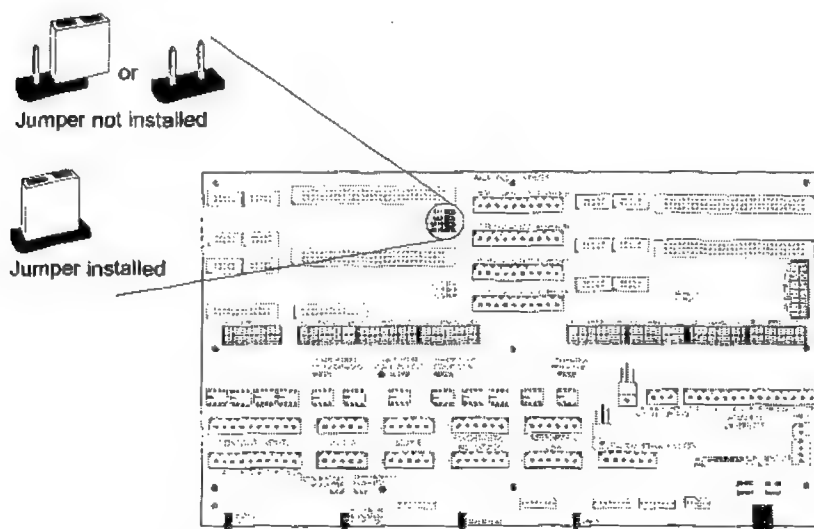
**For 3-phase racks (3-phase 4-wire)**, uninstall LK14 and set the *Current Report* item in the **Config** menu to "All."

**For standard single phase racks (single-phase 3-wire)**, install LK14 and set the *Current Report* item in the **Config** menu to "All."

**For strapped single phase operation** (a single phase or three phase rack with all phase busses strapped together) uninstall LK14 and set the *Current Report* item in the **Config** menu to the single phase you are using in that rack.

#### Set Wiring Harness Type

Make sure that LK2 is uninstalled. This jumper is not used for CD80sv Retrofit Kit installations in CD80 racks or CD80 Advanced Electronics racks.



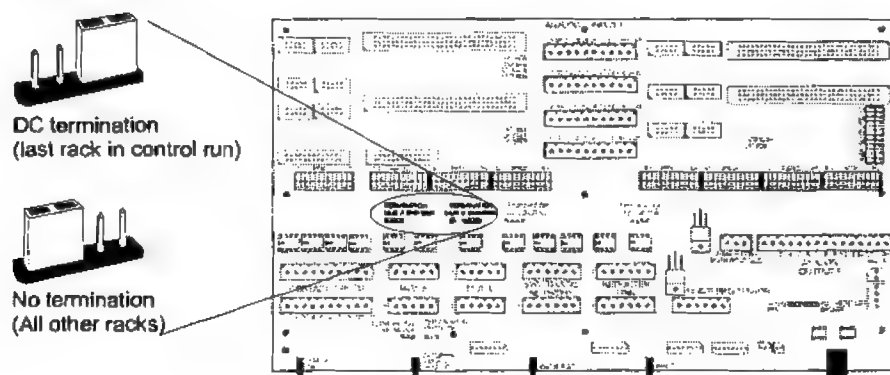
**Figure 4. Rack Configuration**

**Auxiliary Wiring** Auxiliary wiring depends on the system configuration and is shown in the system drawings you received from Strand Lighting. The CD80sv Retrofit Kit lets you hook up two separate consoles, multiple slider stations, and a pushbutton control station. Review all of your special wiring requirements with your Strand Lighting dealer or representative.

**Connections Between Racks** For all control console and overtemperature connections that are connected between racks, no changes are required.

**Primary Dimmer Control Wiring** The primary dimmer control wiring (AMX192, DMX512, or D54) was installed when the dimmer racks were first installed. This control wiring has already been connected to the Retrofit Interface PCB using the existing 10-pin Molex (for CD80 dimmer racks) or two ribbon cables (for CD80 Advanced Electronics racks). Please see the CD80 Rack Operators Reference or CD80 Advanced Electronics User's Manual and consult your original installation drawings if you have any questions about this wiring.

**Dimmer Control Wiring Termination** If the system is being controlled by DMX512, the last rack in the control cable run should be DC terminated. All other racks should be unterminated.



**Figure 5. DMX512 Termination**

## Additional DMX512 Dimmer Control Wiring

In addition to the original dimmer control signal that was already wired into your rack, you can connect an additional multiplex dimmer control signal to the CD80sv Retrofit Electronics Chassis.

The last rack in the control cable run should be DC terminated. All other racks should be unterminated. Termination for the control signal is set on the CIC (see figure 5).

All additional wiring for control signals should be to the Mux A or Mux B connectors on the Retrofit Interface Card.

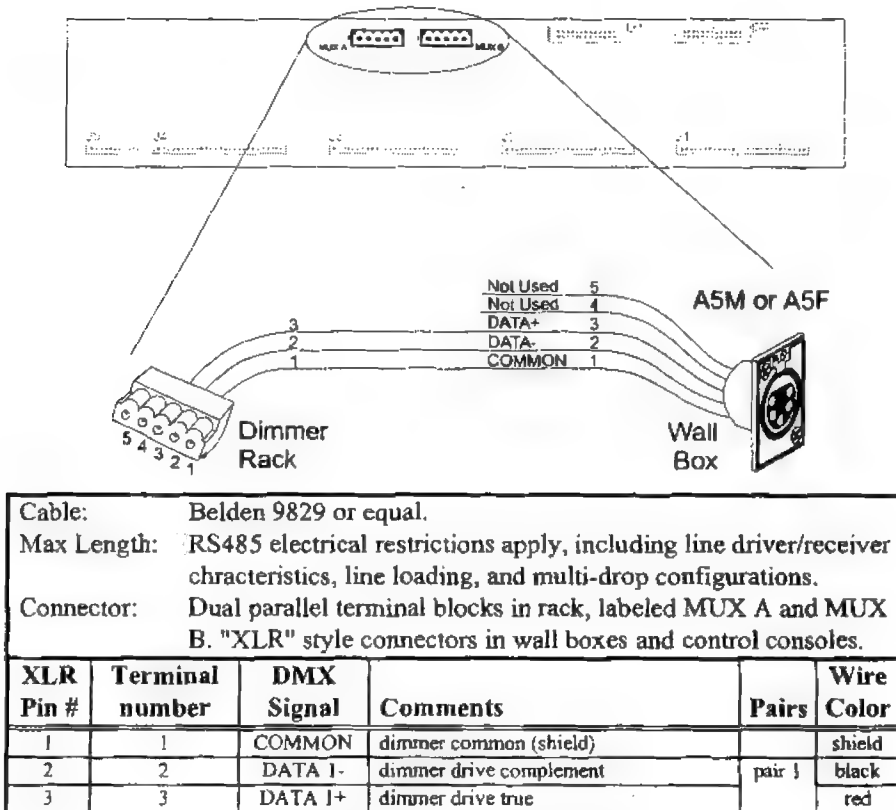


Figure 6. DMX512 Wiring

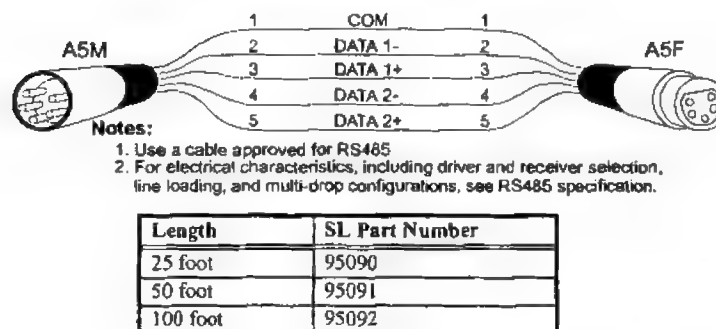
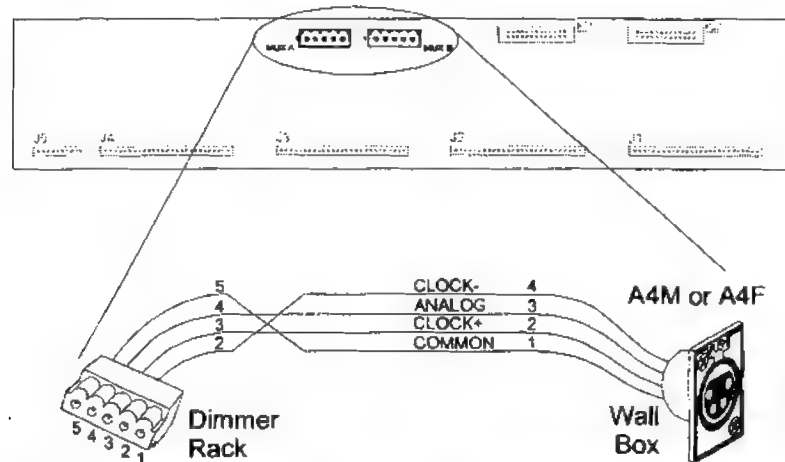


Figure 7. DMX512 Dimmer Control Extension Cable

## AMX192 Control Wiring

The three types of connections provided in Strand Lighting equipment for the AMX192 signal are the XLR style connector, the TA4/TY4 Series mini-SwitchCraft connector, and terminal blocks. Unless otherwise specified, dimmer racks use terminal block connections and consoles use XLR style connectors.

AMX192 control lines are not terminated.



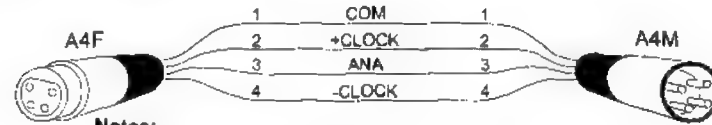
Cable: Belden 9156 or equal. May use Belden 8723 for adapters under 100 feet (30m) long.  
 Max Length: 1000 feet (300m). must be Daisy chained - no branching runs.  
 Connector: Dual parallel terminal blocks in rack, labeled MUX A. "XLR" style connector, or SwitchCraft TA4/TY4 series connector on control consoles.

XLR Pin #	TA4/TY4 Pin #	Terminal number	Signal	Comments	Belden 8723	Belden 9156
4	1	2	CLOCK -	clock complement	Green	Black
2	3	3	CLOCK +	clock true	White	White
1	2	5	COMMON	analog common	Black	Black
3	4	4	ANALOG	multiplexed analog	Red	Red

*CLOCK+ and CLOCK- are one twisted pair. Analog and Common are one twisted pair.*

**Figure 8. AMX192 Wiring**

AMX192 extension cables use Belden #9156 or equivalent cable (2 pairs of unshielded 18 gauge wire).



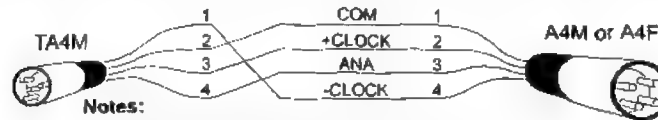
**Notes:**

1. Use Belden 9156 cable
2. Maximum extension length = 1000 ft. (300m) including all adapters

Length	SL Part Number
12 foot	95521
25 foot	95524
50 foot	95522
100 foot	95523

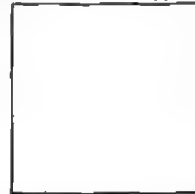
**Figure 9. AMX192 Extension Cable**

Connections between equipment with different plug types require adapter cables in which the plugs are not connected pin to pin (see Figure 10).



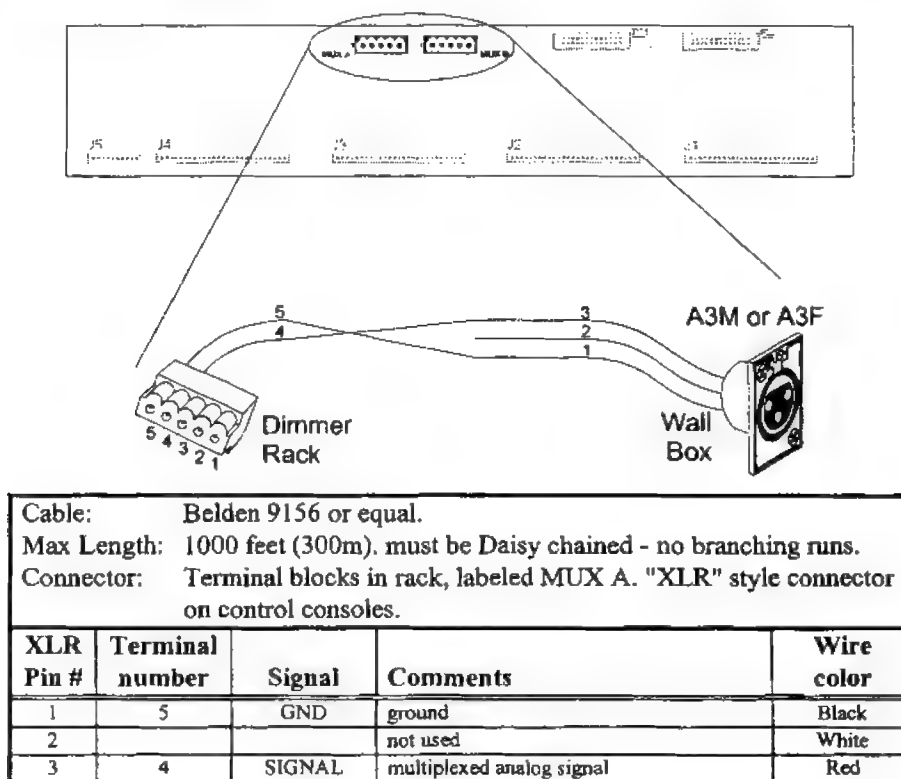
**Notes:**

1. Use Belden 8763 cable
2. Maximum adapter length = 100 ft. (30m)
3. Sex of "XLR" style connector varies with application



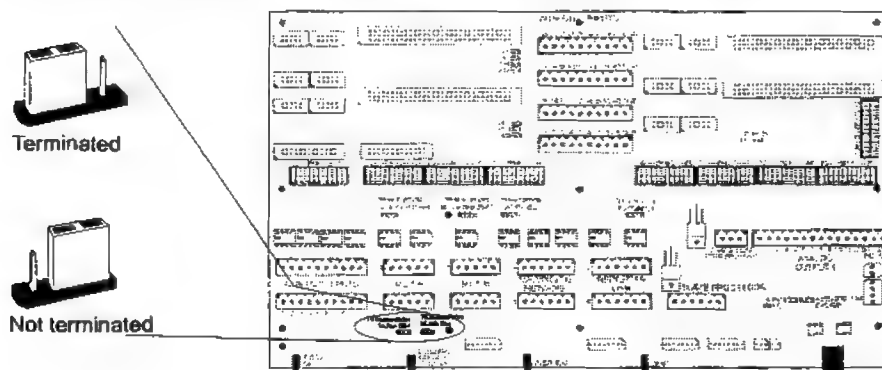
**Figure 10. XLR to TA4 Series Adapter**

**D54 Control Wiring** The two types of connections provided in Strand Lighting equipment for the D54 signal are the XLR style connector and terminal blocks. Unless otherwise specified, dimmer racks use terminal block connections and consoles use XLR style connectors.



**Figure 11. D54 Wiring**

D54 control lines do not usually require termination. However, in installations with very long runs or significant electrical interference, the termination link may be fitted in the last rack in the control cable run.



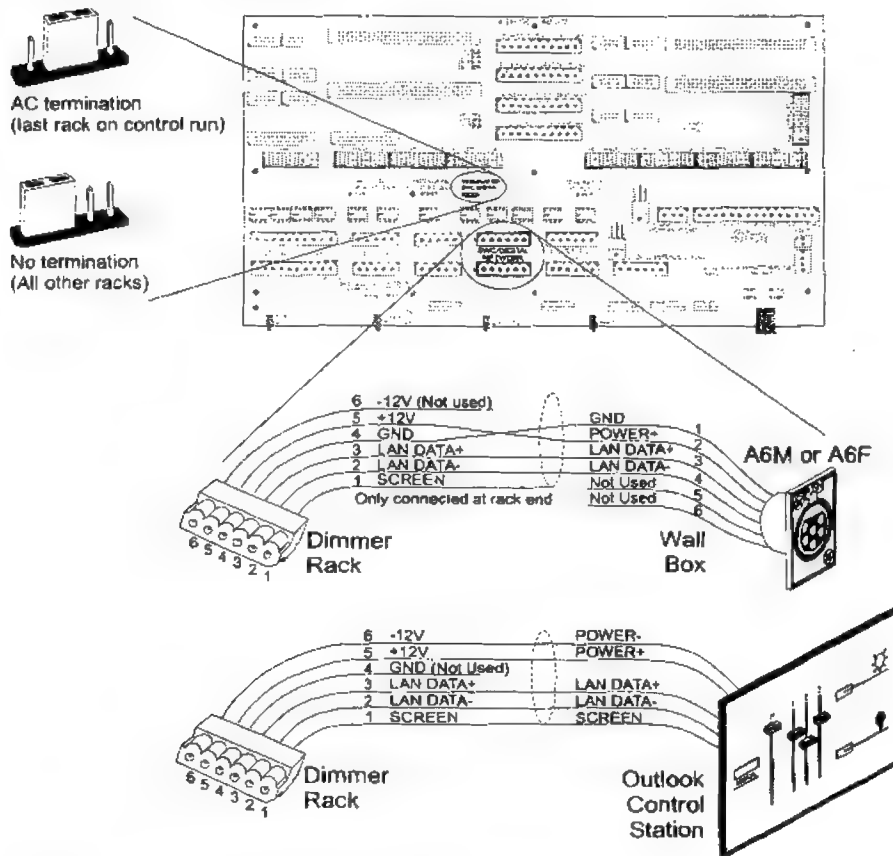
**Figure 12. D54 Termination**



## SWC and Digital Network Control Wiring

Control wiring from SWC hand held controllers and stations such as Outlook is connected to the SWC/DIGITAL NETWORK connector on the CIC. Wiring instructions and appropriate wire gauge sizes are provided on the system riser diagram.

The last rack in the control cable run should be AC terminated. All other racks should be unterminated.



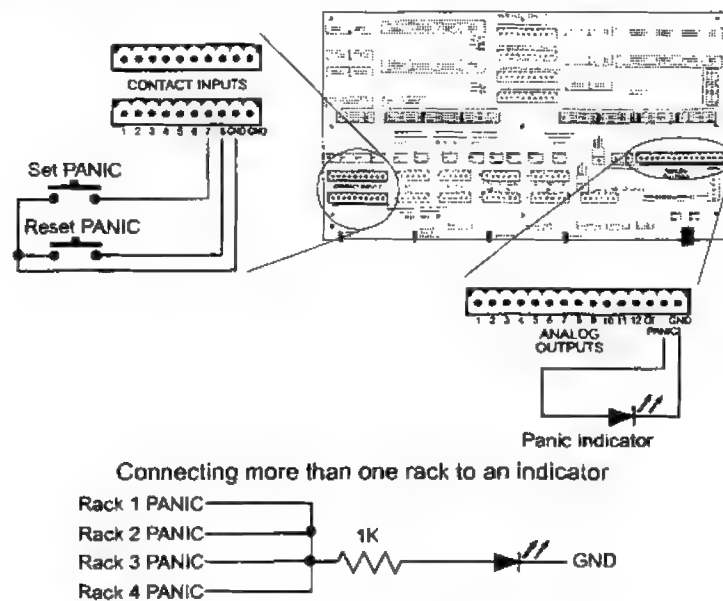
Cable:		Belden 9773 or equal.				
Max Length:		1000 feet (300m - daisy chained runs only).				
Connector:		Terminal blocks in rack, labeled SWC/DIGITAL NETWORK. Unpluggable terminal block on stations.				
XLR Pin #	Rack Term #	Station Terminal Label	Signal Name	Comments	Belden 9773 Pairs	Cable Color
3	3	LAN +	LAN DATA+	network signal true	pair 1	black
4	2	LAN -	LAN DATA-	network signal complement		red
2	5	V +	POWER +	+12V	pair 2	black
N/C	6	V -	POWER -	-12V		white
1	4	N/C	GND	Ground	pair 3	black
1	N/C	N/C	GND	Ground		green
N/C	1	SCREEN	SCREEN		Screen wire	

Pair 3 can be paralleled with pair 1 for long runs where there are no SWC outlets.

**Figure 13. SWC/Outlook Wiring and Termination**

Wherever possible, control station runs should be single pulls directly from the first control station in a daisy chained run. If connections must be made in a junction box due to length of run or other considerations, these connections must be soldered before installation of the wire nut. These are not power connections. They are electronic interconnections which feed data directly to a microprocessor in the processor module. Poor connections may cause problems by introducing electronic noise into the system, resulting in poor system operation.

**Panic Control Wiring** Panic control wires are connected to the CONTACT INPUTS terminal block. Wiring instructions are included on the riser diagram or in your system drawing package. If you do not have a system drawing package, wire the PANIC and NORMAL switches as shown in figure 14.



**Figure 14. PANIC Wiring**

In multiple rack systems you can connect panic contacts in parallel across more than one rack. All racks that are connected in parallel will then be activated by a single switch.

You can connect multiple panic contacts and/or LEDs in parallel for activation from multiple locations.

## Automatic PANIC Setting

PANIC can be automatically activated when the processor (or both processors in a dual processor system) is removed, and automatically deactivated when a processor is reinstalled.

To activate automatic panic, install the jumper between pin 1 and pin 2 of link LK8. To deactivate automatic panic, install the jumper between pin 2 and pin 3 of link LK8. The CIC ships with automatic panic activated.

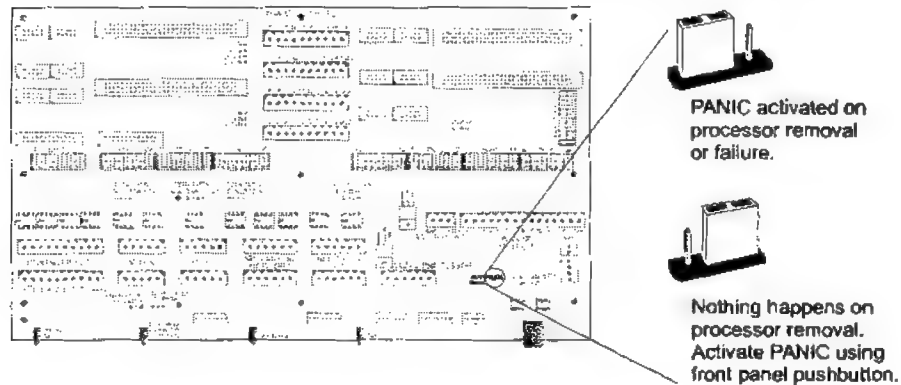


Figure 15. Automatic PANIC Setup

## Other Contact Connections

You can connect several other external contacts for controlling rack functions (see figure 16). These functions are then available remotely and instantly.

*The Mux A/B switch is active only when Proc.Control in the Rack Config menu is set to Select by Contact.*

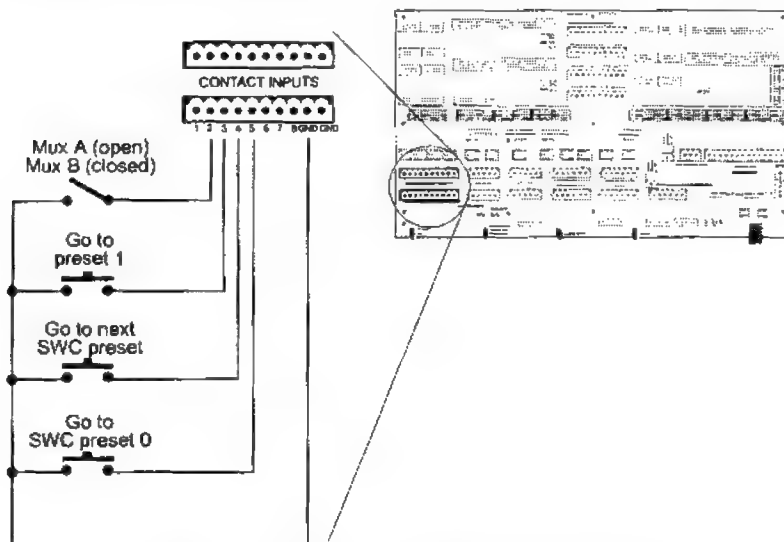


Figure 16. Other Contact Connections

## Overtemperature Warning LED Wiring

You can connect an external overtemperature warning LED to the system if you wish. The external indicator is connected to the ANALOG OUTPUTS connector on the CIC (see figure 17). This LED is an indicator only and has no effect on system performance.

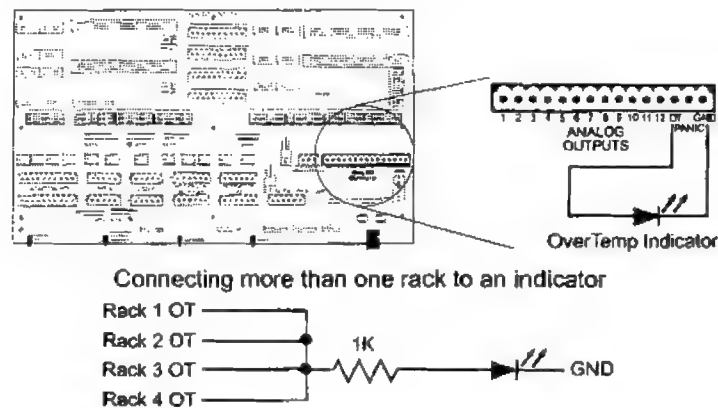


Figure 17. Overtemperature Warning LED Connection

## Analog Control

Processor modules have 32 analog inputs. This control signal is combined with the other control signals according to the Dimmer Mux Mode selected for each dimmer.

For retrofit kits installed in CD80 racks, these signals are input through four pluggable terminal blocks on the CIC. To use the first 16 inputs you must first unplug the connectors that connect them with the Retrofit Interface Kit.

For retrofit kits installed in CD80 Advanced Electronics racks, the first 16 of these signals are input through the original dimmer rack locations in the upper left of the dimmer rack. The remaining 16 signals can be input through rearmost two input connectors on the CIC.

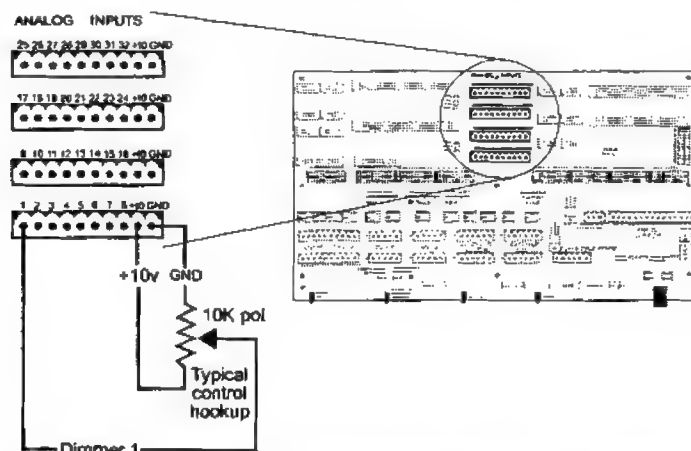
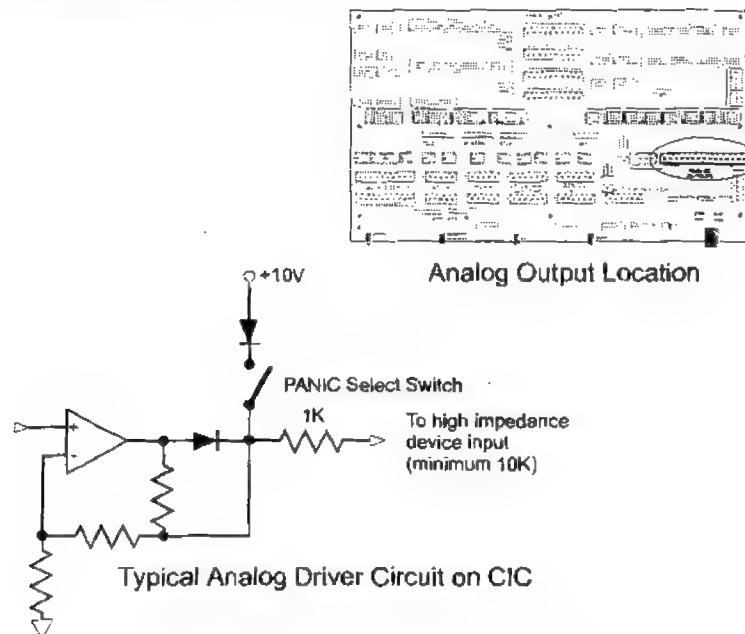


Figure 18. Typical CD80 Analog Control Hookup

**Analog Output** Processor modules have 12 analog outputs, which can source a maximum of 1mA into a high impedance input (minimum 10K $\Omega$ ). The circuit shown below represents the driver circuit on the CIC.



**Figure 19. Analog Output Drivers**

For programming purposes, analog outputs are numbered starting with the first number above the highest dimmer number in the rack. A rack with 96 dimmers has analog outputs numbered from 97 to 108. A rack with 80 dimmers has analog outputs numbered from 81 to 92.

## Selecting Dimmers for Panic Operation

Panic turns any single dimmer, combination of dimmers, or all dimmers ON, bypassing system electronics.

Select panic for a dimmer using DIP switches located on the CIC (see figure 2). Each rack has 96 panic switches. In addition, racks with 96 channel processors have 12 analog outputs that can be tied to PANIC with their own set of DIP switches (labeled AN OUTPUT on the CIC).

*Not all racks have a direct numerical relationship between the PANIC selection switch number and the dimmer controlled by the switch. If a PANIC selection switch does not control the dimmer you think it should, use the View Panic Map item in the Rack Config menu to see which dimmer the switch controls.*

Dimmers and analog outputs with switches ON are switched ON when you activate panic, regardless of their control station settings. Dimmers or analog outputs with panic select switches OFF are not affected when panic is activated. Analog output ON is +10VDC. Racks are shipped with all switches OFF.

*When panic is activated, any analog output set for PANIC will be sent +10VDC, regardless of how the analog output scaling is set. Any dimmer with a maximum output level will be set to FULL regardless of how the maximum output voltage is set.*

### To activate panic:

1. If the processor module is installed, press PANIC on the rack to turn selected dimmers in the rack ON.
2. If you have a remote PANIC station, press PANIC on the station to turn selected dimmers in the rack ON.
3. If you have the automatic PANIC activation jumper (LK8) set to activate PANIC on processor removal, removing the processor module will turn selected dimmers in the rack ON. Systems with two processor modules must have both modules removed to activate PANIC. You should not use this method just to activate PANIC, since it will cause wear and tear on the processor module connectors.

### To deactivate panic:

1. If the processor module is installed, press NORMAL on the rack or on a remote PANIC station to turn selected dimmers in the rack OFF.
2. If you have the automatic PANIC activation jumper (LK8) set to activate PANIC on processor removal, re-install the processor module to turn selected dimmers in the rack OFF.

*Make sure that the reason for removing the processor module has been repaired before re-installing the module.*

---

## Closing the Rack

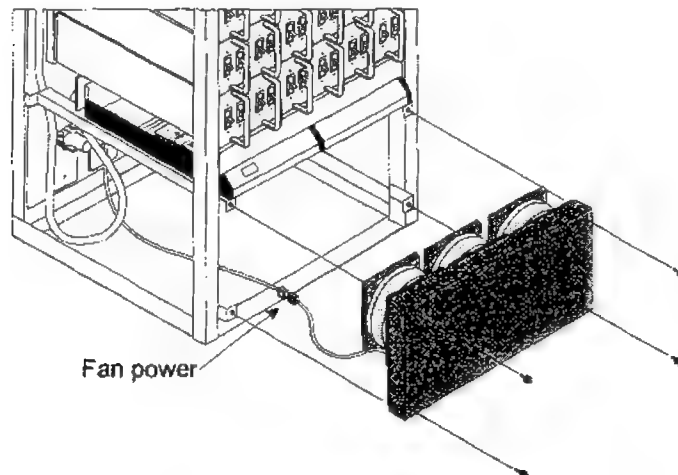
Once installation is complete, you should recheck all wiring, close the system, and apply power.

**Check All Wiring** Before applying power to the system you should double-check all of your wiring.

1. Check that all terminals and mechanical fixings are secured.
2. Check for stray wire strands and make sure wires are correctly restrained and not in contact with metal edges or obstructing the power module ventilation paths.

**Close the Rack** Once all internal settings are completed, and all wiring checked, you can finish installing the fan and dimmer modules.

1. Replace any dimmers and dimmer trays you removed to make it easier to work on the rack.
2. Slide the electronics module into the rack and secure it.
3. Connect the fan module.
4. Set the Fan Module into the front of the dimmer rack and secure it with four (4) thumb screws.



**Figure 20. Final Module Installation**

**Apply System Power** Systems purchased without Field Service commissioning (turn-on) are now ready for system power. For such systems, follow the steps below. If commissioning is required, a notice appears on the riser diagram that the system should not be energized without a factory technician present. Call and request scheduling for commissioning as early as possible. Due to heavy scheduling requirements, the normal time required for proper scheduling is at least two weeks.

1. Check power to make certain that it is correctly rated per system riser. If not, correct before proceeding.
2. Apply power to system.
3. Make sure that the fans operate by turning 30 dimmers ON.
4. If the system does not function properly, follow the troubleshooting instructions in chapter 7, *Basic Troubleshooting*. If these steps fail, or for assistance with replacement parts, please call Strand Lighting directly.



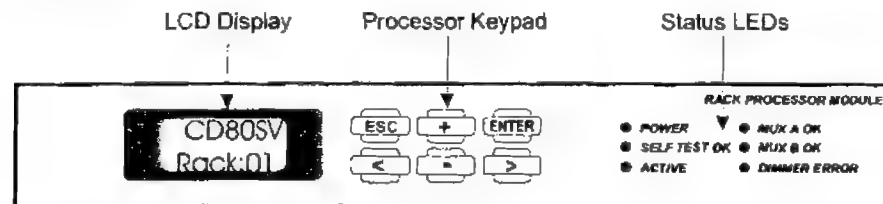
## Setting Up the Processor

Once you have applied power you need to make sure that the system is working correctly and the processor modules are set properly for the installation. This step checks for any problems due to shipping or installation.

**Startup** When the rack is switched ON, a number of self-tests are run. The system displays the rack number.



When the self tests are complete the SELF TEST OK LED on the front of the processor module will turn ON, and the default text will show in the LCD display.



**Figure 21. Processor Module Front Panel**

*If the LCD display shows an error, see the Error Log section of chapter 7, Basic Troubleshooting.*

- After Startup**
1. Make sure that all status indicators show the system operating correctly. The seven LEDs on the front of the Electronics Chassis show (from left to right):
    - Isolated +5V power supply OK (should be ON)
    - External isolated +12V power supply OK (should be ON if the rack contains an optional wall station power supply)
    - Overheat condition (should be OFF)
    - PANIC ON (should be OFF)
    - Phase A, B, and C (A and C should be ON. B should be ON in 3-phase systems)

The LEDs on the front of the processor module show:

- POWER (should be ON)
- SELF TEST OK (should be ON)
- ACTIVE PROCESSOR (should be ON in the active processor)
- MUX A OK (should be ON if there is a signal on Mux A)
- MUX B OK (should be ON if there is a signal on Mux B)
- DIMMER ERROR (should be OFF)

2. Check the following items to make sure they are correctly set in the processor module:

- Slot type (see *Rack Config Menu* in chapter 5, *Front Panel Programming*)
- Rack number (see *Rack Config Menu* in chapter 5, *Front Panel Programming*)
- Starting multiplex signal number and dimmer protocol (see *Patching Menu* in chapter 5, *Front Panel Programming*)
- Time and date (see *Rack Config Menu* in chapter 5, *Front Panel Programming*)

Other items you may wish to check at this time, depending on your system configuration, are:

- Mux patch (see *Patching Menu* in chapter 5, *Front Panel Programming*)
- Outlook patch (see *Patching Menu* in chapter 5, *Front Panel Programming*)
- Language (see *Rack Config Menu* in chapter 5, *Front Panel Programming*)
- Max Voltage (see *Rack Config Menu* in chapter 5, *Front Panel Programming*)
- Min Level (see *Rack Config Menu* in chapter 5, *Front Panel Programming*)

3. Switch on all load circuit breakers.
4. Connect a suitable luminaire to each outlet and check every dimmer using the SET LEVEL control facility, a suitable control console, or an SWC hand held controller. Investigate and correct any malfunctions you find.

*If any dimmers do not work, stop and check the slot type for the dimmer. Dimmers will not work if their slot type is incorrectly assigned. Make sure that all of the modules are in their correct slots, and that the slot type for each dimmer is correctly set in the processor module.*

5. Install the fan screens, door, and processor security panel (if required) to complete the system installation.




## Chapter 5

This chapter gives the basics of how to program the processor module from its front panel. In general, it will be easier to do any setup with a PC running the Reporter software, but this interface lets you do simple programming at the rack without needing to drag a computer to the dimmer room. After the initial *Navigating the System* section, this chapter is organized by menu, in the order the menus appear in the processor module **Main** menu. Each section provides a menu diagram and gives details on how to select and program various features using the processor module keypad and display.

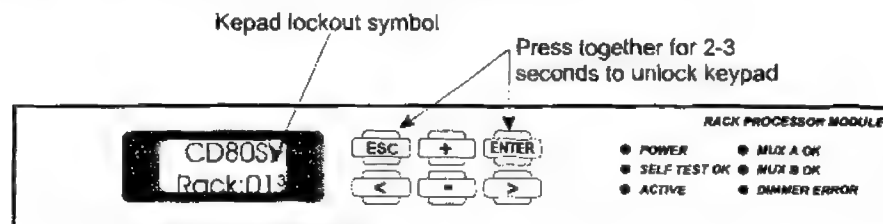
Navigating the System .....	50
Default Display .....	55
Main Menu .....	56
Outlook Presets Menu .....	59
SWC Preset Menu .....	61
Mux Inputs Menu .....	66
Patching Menu .....	69
Dimmer Curves Menu .....	76
Dimmer Response Menu .....	80
Event Report Menu .....	81
Rack Config Menu .....	81
Calib Menu.....	92
Error Log.....	98

## Navigating the System

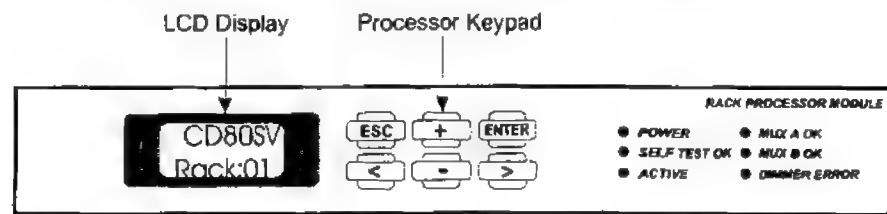
You can access a range of programmable features through the use of the processor module's keypad and 16 character display. The menu system is designed to minimize multi-level menus and keep operation simple. Menus can be shown in French, German, Spanish, or English. English is the default language and this text assumes that English is selected.

**Keypad Lock** To avoid tampering by unauthorized personnel, the processor includes a security mechanism indicated by a key (  ) on the display. If this key appears, you must press \$ and ! simultaneously and hold them for about 2 seconds to unlock the system before any of the keys will respond.

This feature can be enabled and disabled from the **Rack Config** menu by using the *Set Key Lock* item. When this item is enabled, the processor is locked automatically after 10 minutes with no keyboard input. When this item is disabled, the system is always unlocked. The factory default setting for the *Set Key Lock* item is "Disabled."



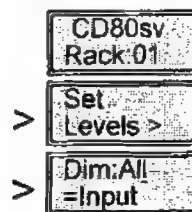
**The Keypad** The keypad has 6 buttons which let you navigate through the LCD menus.



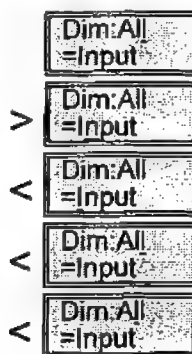
**Figure 26. Keypad Layout**

**< and >** let you go to a submenu, move between fields, or move along a large numeric field. An underline cursor shows which field or digit is selected.

Displays with submenus have an arrow in the lower right corner. Press > in these displays to go to the next menu level.



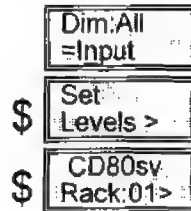
Once you are in a working menu, > sends you to the next field, or to the next number in a scrolling numeric field, and < sends you to the previous field or to the previous number in a scrolling numeric field (see *Fields* below).



The active "digit" will change through all "digits" in a field even if the current value of the field is a text string.

**+ and -** are used to adjust a numeric field shown in the display or to scroll between options in a field.

\$ leaves an option or menu and returns you to the previous menu level. Some options require positive confirmation with !. You will be prompted if confirmation is required. Since we have made no changes to the dimmers in the examples so far, no confirmation is necessary to leave the menu.



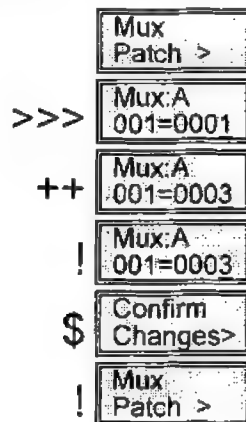
! lets you make changes to fields that are not changed live as you use + and - (not-Live fields). Displays with not-Live fields are shown in the menu trees as follows:



When a field displays "All," you must press ! to action a change. Fields with "All" as an option are shown in the menu trees as follows:



Finally, ! lets you confirm changes made in a not-Live field when you exit the display using \$ and get the "Confirm Changes" message. To cancel the operation once you get the message, press \$.



**Fields** There are three types of fields used in the LCD displays.

- Display fields
- Selection fields
- Scrolling numeric fields

### Display fields






Display fields are used as labels or to show data which cannot be changed. When you use < or > to move through a display, the cursor skips these fields.

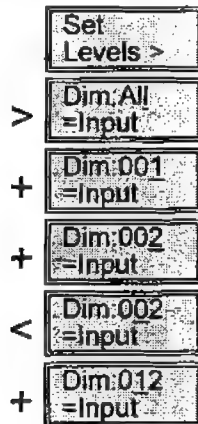
### Selection fields

Selection fields let you scroll through a fixed list of options. When you use < or > to move through a display, the cursor lands on the first character or number of these fields. The only way to change the values in these fields is with + and -.

Selection fields can have text values, numeric values, or both. Some text values allowed in otherwise numeric selection fields are Off, Full, and dash ("-"), meaning "none".

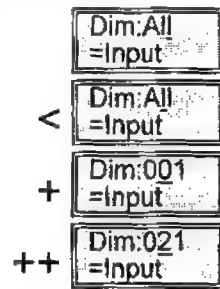
### Scrolling numeric fields

Scrolling numeric fields let you scroll individual digits of the number to easily change numbers with multiple digits. Scrolling numeric fields can also have valid text values (e.g. "All"). When you use < or > to move through a display, the cursor lands on the ones digit. If the current value is a text value, the cursor lands on the letter that is in the ones digit position. Once in a scrolling field you can use  and  to select the digit you want to increment, and then use  or  to increment or decrement the selected digit. When a digit reaches 9, pressing  again will set that digit to 0 and increment the digit to its left.





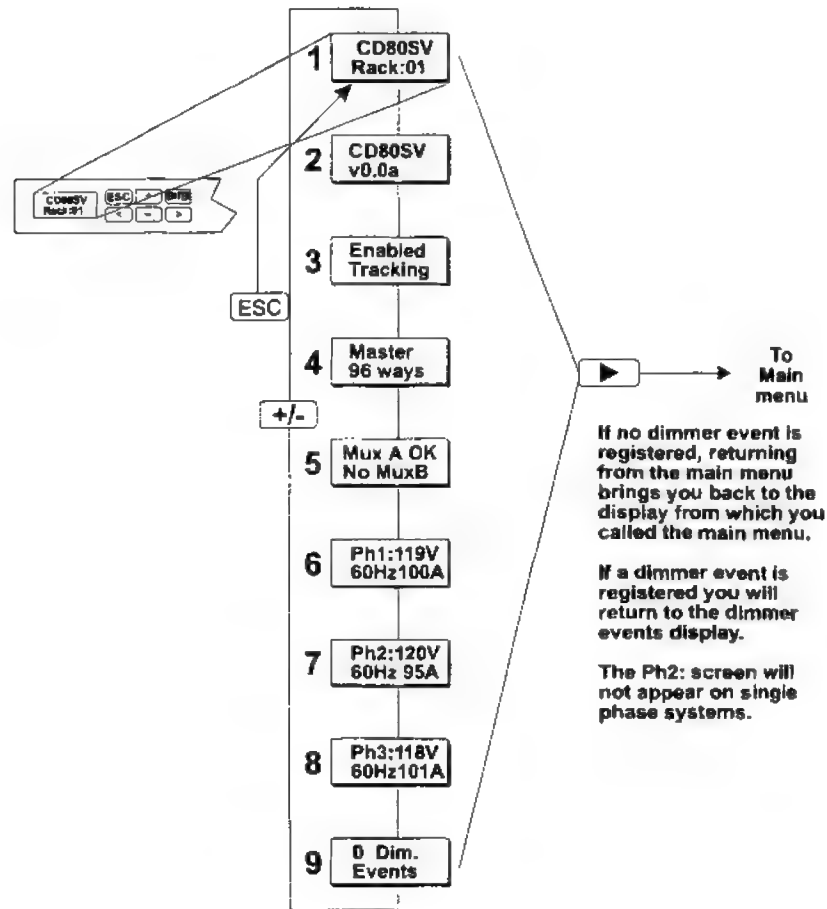
If you know you want to increment the tens digit only, you can move to the tens digit while the display still shows “All.”



Some text values allowed in scrolling numeric fields are Off, Full, dash (“-”, meaning “none”), and Hold.

## Default Display

The default display lets you access a series of status displays using + and -, and lets you access the **Main** menu by using >. The diagram below shows the status items you can access from the default display.



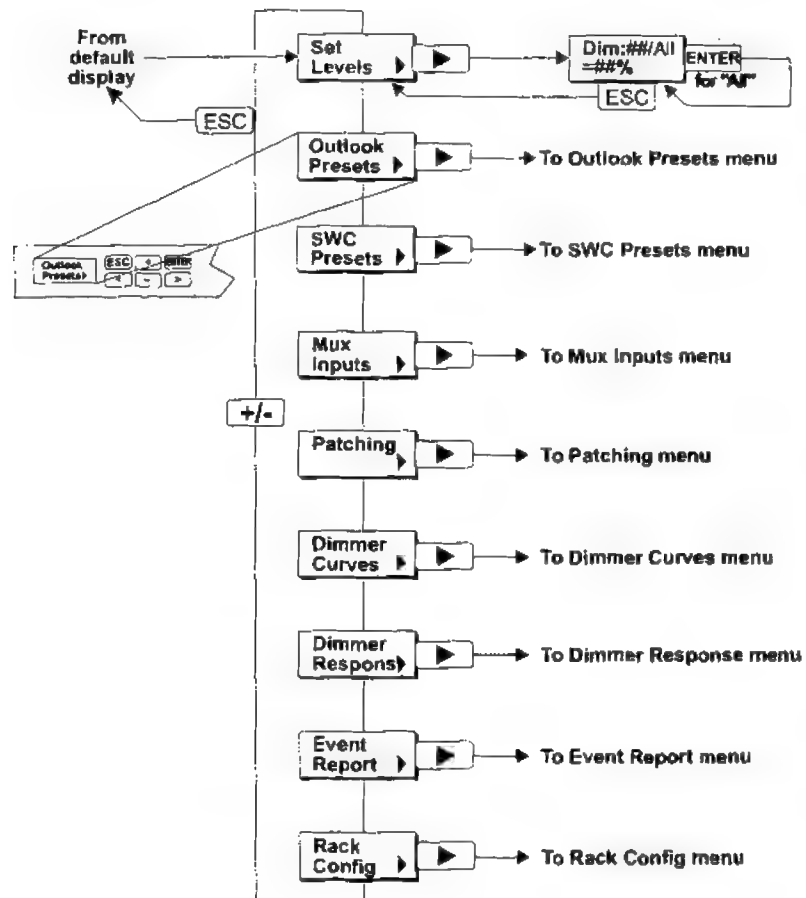
The default displays are information only displays which let you check several pieces of system information without needing to go through multiple menu levels. The description numbers below correspond to the numbers next to the display in the figure.

1. The Default display shows the dimmer rack type and rack number.
2. The Version display shows the dimmer rack type and the software version number.
3. The Backup display shows which processor is enabled, and whether or not there is a backup processor. The currently operating processor will show "Enabled," while the current backup processor shows "Disabled." "Tracking" in the second row shows that there is a backup processor, while "No Track" shows that there is no backup processor. When the backup and main processor are functioning, both displays should say "Tracking." When the system is properly tracking, data is continuously copied from the "Enabled" processor (Master) to the "Disabled" processor (Backup).
4. The Size display shows whether the processor is "Master" or "Backup," and how many dimmers are fitted.

5. The Mux display shows whether Mux A is currently functioning, and shows whether Mux B is operational.
6. The Ph1 display shows the voltage, frequency, and current for phase 1. Current will always be 0 (zero) on the processor that is "Tracking," and on systems without Reporter dimmers.
7. The Ph2 display shows the voltage, frequency, and current for phase 2. Current will always be 0 (zero) on the processor that is "Tracking," and on systems without Reporter dimmers. This display will not appear in systems set up for single phase operation.
8. The Ph3 display shows the voltage, frequency, and current for phase 3. Current will always be 0 (zero) on the processor that is "Tracking," and on systems without Reporter dimmers.
9. The Events display shows number of dimmer events currently active and the nature of the events in a scrolling display.

## Main Menu

The **Main** menu lets you access all of the other sub menus for configuring the CD80sv Retrofit Kit.



**Set Dimmer Levels** This function lets you test individual dimmers and loads directly from the keypad, regardless of the signals being received from presets and other inputs.

*Since this overrides the control inputs, including the presets, it is possible to completely disable any or all of the dimmers. Use this function carefully. It is easy to completely lose control of dimmers by forgetting to set them back to Input. Levels set here are remembered even if you shut power to the system OFF.*

Normally this control is set to All=Input, which lets the Mux inputs, analog inputs, and presets control the dimmer levels. The relationships of the inputs to each other are determined by the Dimmer Mux Mode setting.

This control may also be used to set dimmer levels to record SWC and Outlook presets where there is no conventional lighting control system.

To set all dimmers to 50% follow the steps below.

Action	Result
	CD80sv Rack:01
>	Set Levels >
>	Dim:All =Input
>	Dim:All =Input
+ until	Dim:All =50%
!	Dim:All =50%
\$	Confirm Changes
!	Set Levels >
\$	CD80sv Rack:01

To set dimmers 5 and 8 to 90% follow the steps below.

Action	Result
	CD80sv Rack:01
>	Set Levels
>	Dim:All =Input
+ until	Dim:05 =Input
>	Dim:05 =Input
+ until	Dim:05 =90%
<	Dim:05 =Input
+ until	Dim:08 =Input
>	Dim:08 =Input
+ until	Dim:08 =90%
\$\$	CD80sv Rack:01

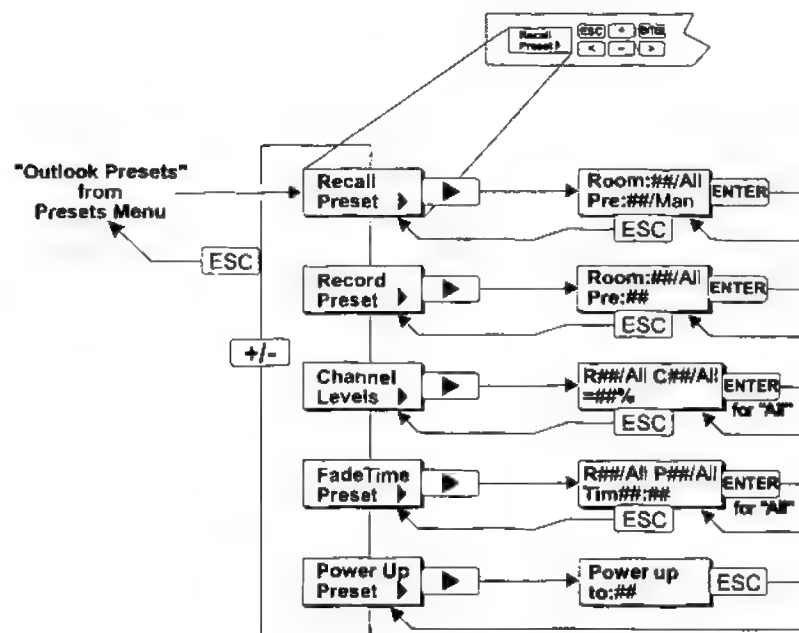
## Outlook Presets Menu

*Before using Outlook presets, ensure that the room/channel/dimmer assignment has been correctly set (see page 64).*

There are 10 Outlook presets per room. Eight of them (1-8) are user programmable. Preset 0 is a non-recordable blackout state, preset 9 is all dimmers full ON, and MAN is the current slider settings being received from an active slider control station. When you record a preset, you record the actual dimmer levels as they appear in your room. Outlook presets and SWC presets are completely separated, and separately controlled, even though they can control the same dimmers. If you are using the SWC hand held controller, SWC pushbutton controllers, or SWC A/V interface, see *SWC Preset Menu* (page 52).

Outlook presets can be recalled and added to the dimmer output on a "highest takes precedence" (HTP) basis from the processor module keypad or from a control station. Selecting a preset crossfades the output of the Outlook preset processor from the previously selected preset to the new preset in the programmed fade time.

*Don't forget that Outlook presets are not the only source of control in a dimmer rack with the CD80sv Retrofit Kit. If a dimmer has control input from other sources, the Dimmer Mux Mode setting for each dimmer determines what signals appear at the dimmer. If a dimmer is ON from another source, you may not be able to fade it OFF using Outlook presets. In addition, the dimmer levels are affected by Max voltage and Min Level settings.*



## Recording and Recalling Presets

You can record the current dimmer output to any of the 8 recordable Outlook presets per room.

1. Set up the lighting state using any means of control.
2. Use the *Record Preset* menu item to select a room and preset number.
3. Press ! to record the current dimmer levels to the selected preset.
4. Repeat for any other presets.

You can activate any Outlook preset by using the *Recall Preset* menu item to select a room and preset number.

*Don't forget--Recall Preset changes the lighting levels by activating the preset. It is not a "blind" viewing facility.*

## Set Channel Levels

You can set channel levels directly from the keypad by selecting their room & channel number, and setting a level. This lets you test individual dimmers and loads regardless of the signals being received from the different inputs.

*Since this overrides the control inputs, including the presets, it is possible to completely disable any or all of the dimmers. Use this function carefully. It is easy to completely lose control of dimmers by forgetting to set them back to Input.*

Normally channel levels are set to All=Input, which lets the Mux inputs, analog inputs, and presets control the dimmer levels. The relationships of the inputs to each other are determined by the *Dimmer Mux Mode* setting.

This control may also be used to control dimmers recording into SWC and Outlook presets where there is no conventional lighting control system.

## Set Fade Times

You can set the fade time (up to 10 minutes) for all Outlook presets in all rooms, for all presets in a specified room, or for one preset at a time by using the *Fade Time Preset* menu item.

To set a fade time for the manual faders, select the "Man" setting in the preset field. Manual fade time is set per room. The default for the manual preset is ZERO seconds. With a ZERO time set, when you press "Manual" or "Take Control" on an Outlook slider station the lighting instantly fades from the current level to the levels set on the sliders. If a manual fade time is programmed, the channels fade from their current levels to the slider levels in the programmed time.

Setting the fade times for all presets in all rooms or all presets in one room will not change the manual fade time. If you move any slider on the station that currently has control while a manual fade is in progress, the lighting levels will instantly conform to the current slider levels.

**Set the Power Up Preset** You can select an Outlook preset that will always appear when the system is powered up (e.g., after a power failure). The default preset is ZERO, which sets the entire system to a blackout on power-up. Use the *Power Up Preset* menu item to select the preset number. This setting applies to all rooms in the system. For instance, if you select preset 1 then each room will fade to its own preset 1 on system power-up.

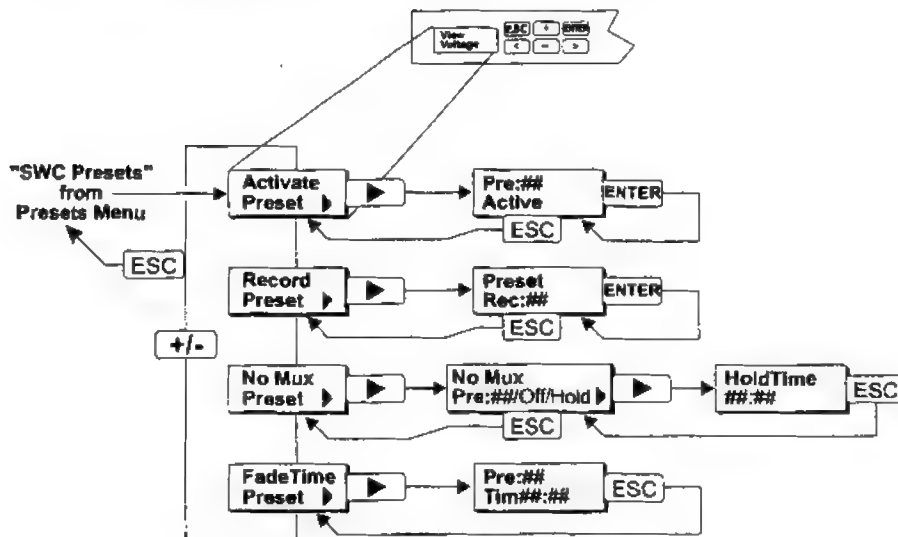
The NoMux SWC preset can act as an overall system power-up preset. If a NoMux preset and a Power Up preset are assigned, the dimmer levels are combined according to the *Dimmer Mux Mode* settings.

## SWC Preset Menu

There are 99 user programmable system wide controller (SWC) presets per system. Preset 0 is a non-recordable blackout state. When you record a preset, you record the actual dimmer levels as they appear on stage or in your rooms. If you are using Outlook controllers, see *Outlook Preset Menu* (page 49). Outlook presets and SWC presets are stored and controlled separately, even though they can control the same dimmers.

Any SWC preset can be added to the dimmer output on a highest takes precedence (HTP) basis by activating it from the processor module keypad, from the SWC hand held controller, or from a PC running the Reporter software. When you activate an SWC preset, the system crossfades from any previously selected SWC preset (or from a blackout).

*Don't forget that SWC presets are not the only source of control in a dimmer rack controlled by a CD80sv Retrofit Kit. If a dimmer has control input from other sources, the Dimmer Mux Mode setting for each dimmer determines what signals appear at the dimmer. If a dimmer is ON from another source, you may not be able to fade it OFF using SWC presets. In addition, the dimmer levels are affected by Max voltage and Min Level settings.*





**Activate a Preset** You can activate the dimmer levels of any SWC preset from the processor module control panel.

*Don't forget--Activate Preset changes the lighting levels by activating the preset. It is not a "blind" viewing facility.*

To activate SWC preset 3, follow the steps below:

Action	Result
	CD80sv Rack:01
> and then + until	SWC Presets
>	Activate Preset >
>	Pre:Off
+ until	Pre:03
!	Pre:03 Active
\$ until	CD80sv Rack:01

To turn off SWC presets, follow the steps below:

Action	Result
	CD80sv Rack:01
> and then + until	SWC Presets
>	Activate Preset >
>	Pre:03 Active
- until	Pre:Off
!	Pre:Off Active
\$ until	CD80sv Rack:01

**Record a Preset** You can record the current dimmer output to any of the 99 user programmable SWC presets.

- 1. Set up the lighting state using any means of control.
- 2. Follow the procedure as shown.
- 3. Repeat for any other presets.

To record the current dimmer output to preset 2 in room 2, follow the steps below:

Action	Result
	CD80sv Rack:01
> and then + until	SWC Presets
>	Activate Preset >
+	Record Preset >
>	Preset Rec:01
++	Preset Rec:03
!	Preset Rec:03
\$ until	CD80sv Rack:01

**Set the NoMux Preset** The NoMux preset is the preset the system will fade to if you lose the Mux signal. What happens to the dimmers if the Mux signal is lost depends on the NoMux setting.

- Hold** System holds current levels on loss of Mux signal.  
HoldTime submenu is disabled if this option is selected.
- Off** System fades to black on loss of Mux signal.
- 1-99** System fades to selected SWC preset on loss of Mux signal.

The default setting is No Mux=Off. No Mux=Hold is a useful safety feature in live performance situations.

*Setting NoMux to Hold may cause problems if the dimmers are left ON after the control desk is turned OFF. Many desks produce unwanted signals as the power fails, and once the desk is turned OFF, the dimmers are susceptible to noise pickup on the Mux Input. This can leave the dimmers unexpectedly ON. If you set NoMux to Hold, make sure unattended dimmers are turned OFF.*

To assign preset 5 as the “backup” with a Hold Time of 30 seconds, follow the steps below.

Action	Result
	CD80sv Rack:01
> and then + until	SWC Presets
>	Activate Preset >
++	No Mux Preset >
>	No Mux Pre:Off>
+ until	Preset Pre:05 >
>	HoldTime 00:10
<	HoldTime 00:10
++	HoldTime 00:30
\$ until	CD80sv Rack:01

In the above example, when both Muxes fail the system will hold the last levels for 30 seconds and then fade into SWC preset 5.

*When you select a new preset for the No Mux preset, the hold time is automatically reset to 10 seconds.*

To set the system to hold levels on loss of Mux signal, follow the steps below.

Action	Result
	CD80sv Rack:01
> and then + until	SWC Presets
>	Activate Preset >
+ until	No Mux Preset >
>	No Mux Pre:05 >
- until	Preset Pre:Hold
\$ until	CD80sv Rack:01

**Set Fade Time** You can set the fade time for all SWC presets in the rack or for one preset at a time. To set the fade time for all presets to 1 second, follow the steps below.

Action	Result
	CD80sv Rack:01
> and then + until	Activate Preset >
+ until	FadeTime Preset >
>	Pre:All Tim00:05
>>	Pre:All Tim00:05
- until	Pre:All Tim00:01
!	Pre:All Tim00:01
\$	Confirm Changes
!	Record Preset >
\$ until	CD80sv Rack:01

# Strand Lighting *Technical Note: Retrokit.doc*

## Addendum to CD80 Retrofit Kit Manual Issue 3.

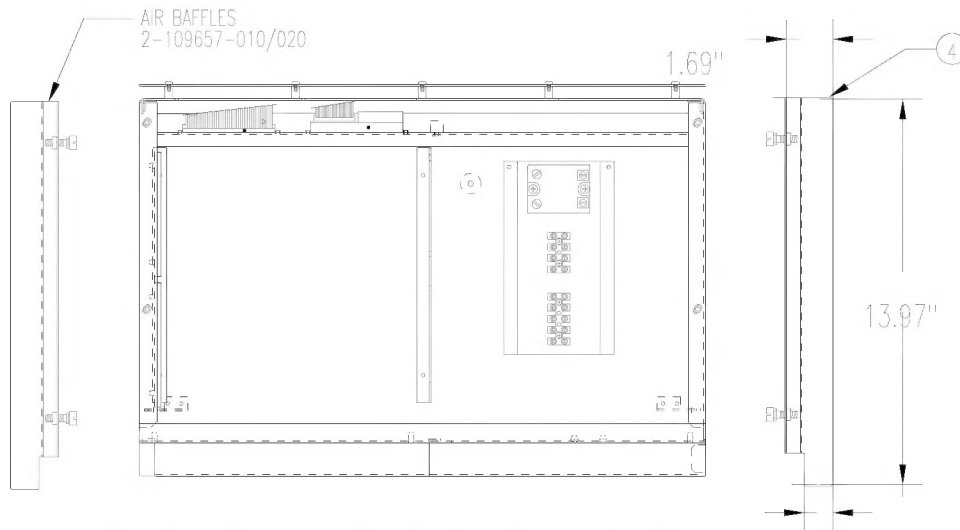
- 1) Site survey of the existing installation is important to identify any additional costs associated with low voltage communications and supply wiring. New wiring for DMX, Outlook, SWC options may be required. The Retro Kit occupies slightly more space in lower portion of the rack just above the supply lugs. If the original installation of supply feeder cables made use of the extra space with the original processor and they may need to be adjusted or trimmed.

The Retro Kit will result in a significant increase of audible noise due to fan kit. Consider the impact of audible noise if the rack is in an acoustically sensitive area. Any acoustic treatments required to lower the noise level are not the responsibility of Strand Lighting.

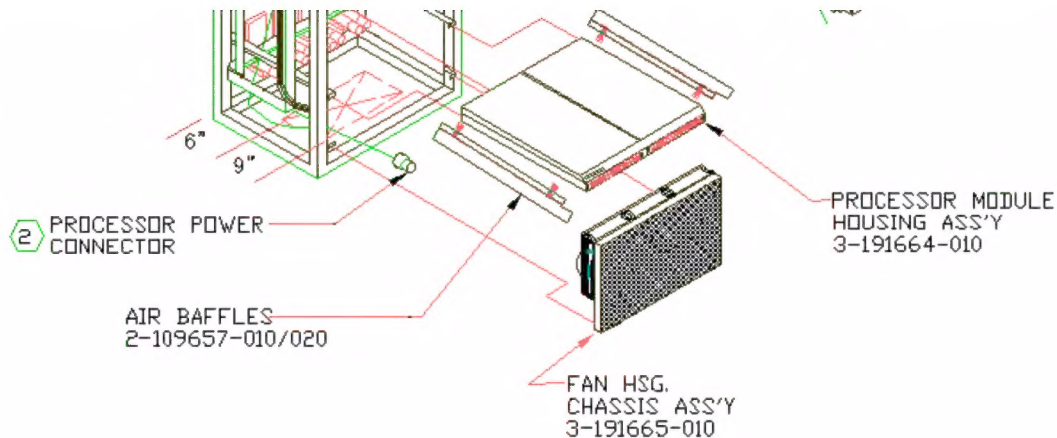
- 2) The drawing in Figure 21 depicts the CD80SV rack with fan module *above* the processor. The CD80 Retro Kit is designed to place the fan module *below* the processor.
- 3) The MDL 5A fuse supplied with the kit replaces the MDL 2A fuse in Phase A position of the existing rack.
- 4) The green ground wire with Amp connector supplied with the kit must be installed on the SV control module connector Pin 1 and connected to chassis ground of the CD80 Rack.
- 5) Two control inputs, Mux A and Mux B are provided on the CD80SV control module. This makes J5, formerly AMX control on the old control module redundant. Make no connection. Mux A on the CD80SV control module is specifically set for AMX 192 or DMX 512. Mux B is exclusively DMX 512.
- 6) It is recommended to run incoming DMX control lines to the *interior* Mux terminal locks or the 1<sup>st</sup> control module leaving *the rear exterior* Mux terminal blocks for daisy chaining.
- 7) Confirm the size and style of any control station back boxes during the site survey. Outlook, Premiere and MicroControl stations do not fit into standard gang boxes. Masonry Deep Back boxes accommodate the control stations without modification. If extension rings are required they must be square opening style, not standard rounded corner versions. Contact Strand Lighting for assistance.
- 8) Outlook wiring to the control module should be shield to Pin 4, not shield to Pin 1 as identified in the manual. Shield to Pin 1 agrees with the identification on the control module.

# Strand Lighting *Technical Note: Retrokit.doc*

- 9) Two small air baffles are required beside the new rack processor. See the drawings below for installation. For bussed racks, a hole must be drilled to pass the fastening screw mounting the baffles through the rack rail. This prevents the baffle from falling on the service bussing in the unlikely event the fastening hardware vibrated loose.



Top View of Rack Processor with baffles uninstalled.



View of baffles and rack.